JL 15 '46

JULY, 1946

THE Refrigeration INDUSTRY

AIR CONDITIONING EQUIPMENT

MERCHANDISING + INSTALLATION + MAINTENANCE

IN THIS ISSUE:

Building a Locker Plant? . . . High Side Floats
On-the-Job Training . . . From the Bottom Up
Cooling for Human Comfort . . . Trouble Shooting

Hose does the Hula ...

AT 1800 WIGGLES A MINUTE

THE Strobotach this man is using will make sure the hydraulic hose lines are vibrating 1800 times a minute.

This wiggling device was designed by Weatherhead engineers to meet SAE specifications requiring the regular testing of sample hose assemblies taken from standard production runs.

The hose is given this grueling treatment for 200 hours to prove the dependability of the complete assembly and serves to demonstrate how it will stand up after years of service on automobile, truck, or bus.

To make the test even tougher, hot oil, held at 250°F. and under 45 pounds per square inch pressure is circulated through the hose lines as they are whipped round and round.

So when you use any Weatherhead products, you're sure of this: It's your best buy because the research and testing behind it have made it the most highly developed, but competitive priced, product of its kind.

LOOK AHEAD WITH

Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND 8, OHIO

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Our Valves, Dehydrators, Strainers, Manifold Assemblies, Accessories and Fittings are illustrated and described in our new catalog. Write for your copy today.

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with popularity hitting an all time high. Proof that by Comparison, they're buying PAR

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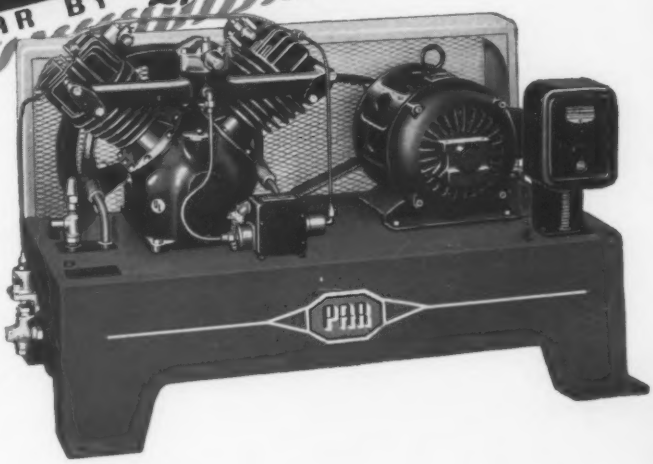


PAR Jobbers, in important trading centers from coast to coast, can give you the story of Par Refrigeration. Models and sizes from 1/6 to 5 H.P. Write for catalog R-97.

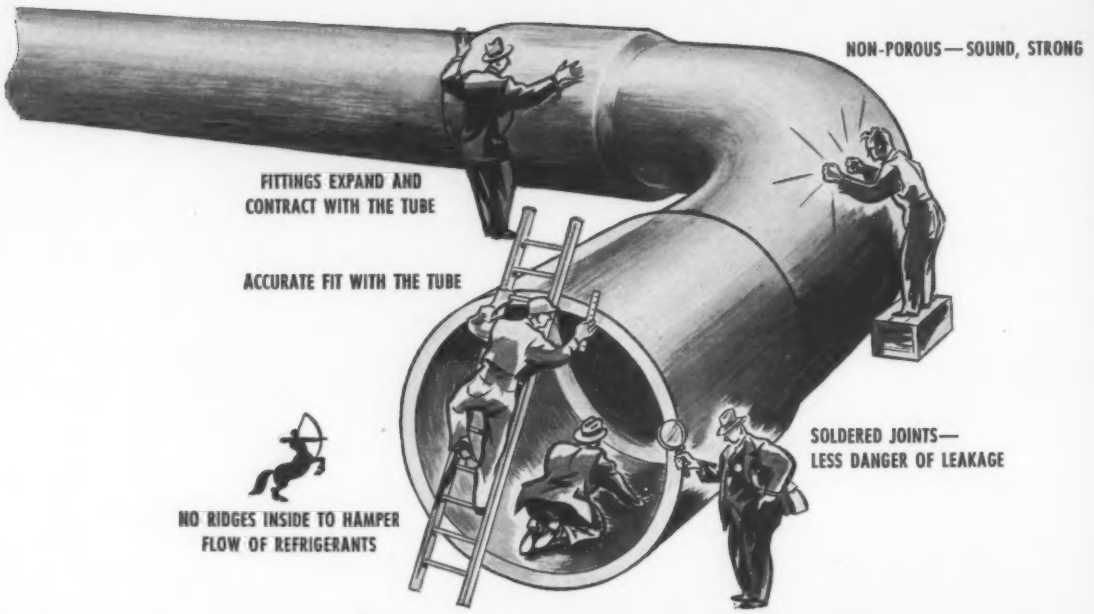
PAR—Condensing Unit Line sold exclusively through Franchised Refrigeration Equipment Wholesalers!

Lynch . . . By Comparison — You'll Buy PAR

Manufacturing Corporation

General Offices, Toledo 1 • Factory, Defiance, Ohio, U.S.A.

CHASE *Wrought Copper* Fittings

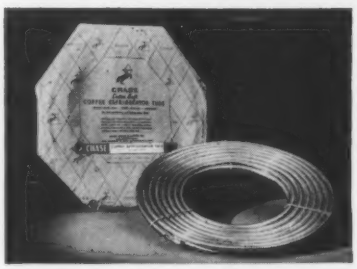

NON-POROUS—SOUND, STRONG
FITTINGS EXPAND AND CONTRACT WITH THE TUBE
ACCURATE FIT WITH THE TUBE
SOLDERED JOINTS—LESS DANGER OF LEAKAGE
NO RIDGES INSIDE TO HAMPER FLOW OF REFRIGERANTS

Make Better Connections!

FOR better connections on the job, use Chase Wrought Copper Fittings and Copper Tube. Wrought copper fittings are so non-porous and sound that not even refrigeration gases can penetrate.

Together, Chase copper fittings and tube form a leak-proof connection. They fit so accurately that no ridges are formed on the inside to hamper the full flow of refrigerants. They expand and contract in exactly the same ratio. And they are not affected by ordinary vibration or pressure.

Copper to copper, installation contractors agree, is the ideal connection. And the ideal fittings, you'll find, for copper refrigeration service tube are Chase *Wrought Copper* Fittings. Ask your distributor for them.



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In a handy new package!

Bright, dry, and oxide-free, Chase Copper Refrigerator Service Tube bends easily, has a new positive end seal that fits anywhere the tube will fit. Packaged in a space-saving envelope. Complete specifications are plainly marked on the outside. Tube sizes ⅛" to ¾" in 50 and 100 ft. lengths.

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THE Refrigeration INDUSTRY

VOLUME 3, No. 7 JULY, 1946

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ABC

THE COVER . . . Even though the war is over, refrigeration continues to play an important role in the development of American aircraft. Low temperature rooms like this one are used to test all types of aviation equipment, such as the propeller model shown here, under sub-zero conditions. (Frigidaire photo).

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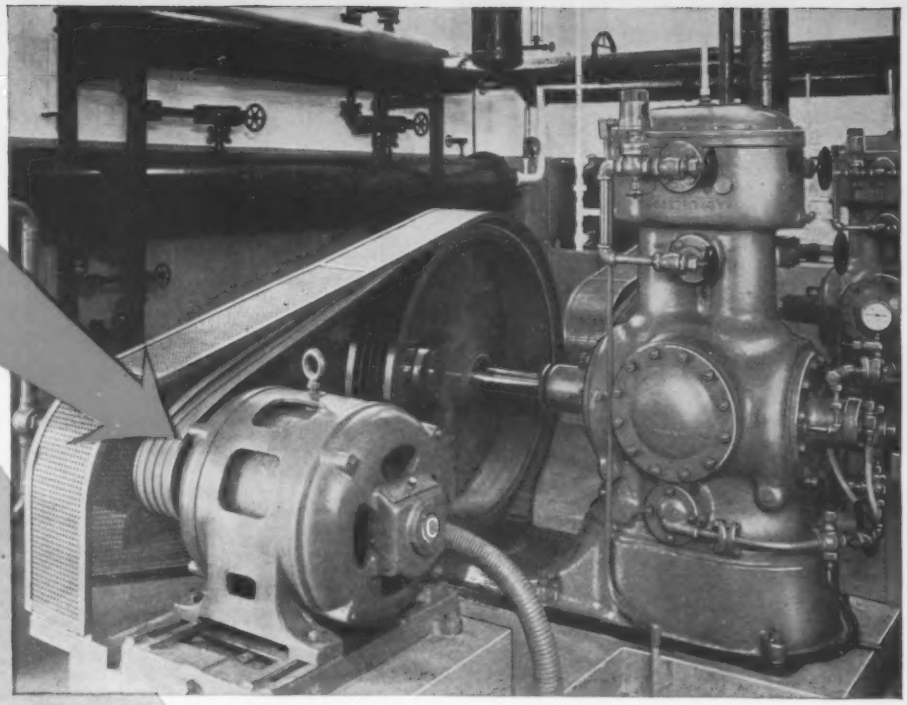
IRVING B. HEXTER, President LESTER P. AURBACH, Vice President

50 horsepower Century motor driving a refrigeration compressor.



The Remarkable Freedom From Vibration of CENTURY Type SCH Motors

Means Smooth, Quiet Operation—Long Life

Illustrating Form J—Polyphase Motor

These refrigeration motors have the high torque necessary to start reciprocating compressors against heavy loads — yet, they come up to speed smoothly and quietly.

Their rigid construction, accurate alignment, mechanical and electrical balance and the precision workmanship on all parts contribute to their remarkable freedom from vibration.

There is a Century Motor ideally suited to each refrigeration, air conditioning or air circulating job — in a wide range of types, from 1/6 to 400 horsepower. Specify Century for all your electric motor requirements. They are engineered to the functional characteristics of, and the conditions surrounding the machines they drive to assure top performance.

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1806 Pine St., St. Louis 3, Mo.
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Century C MOTORS

494

Dayton

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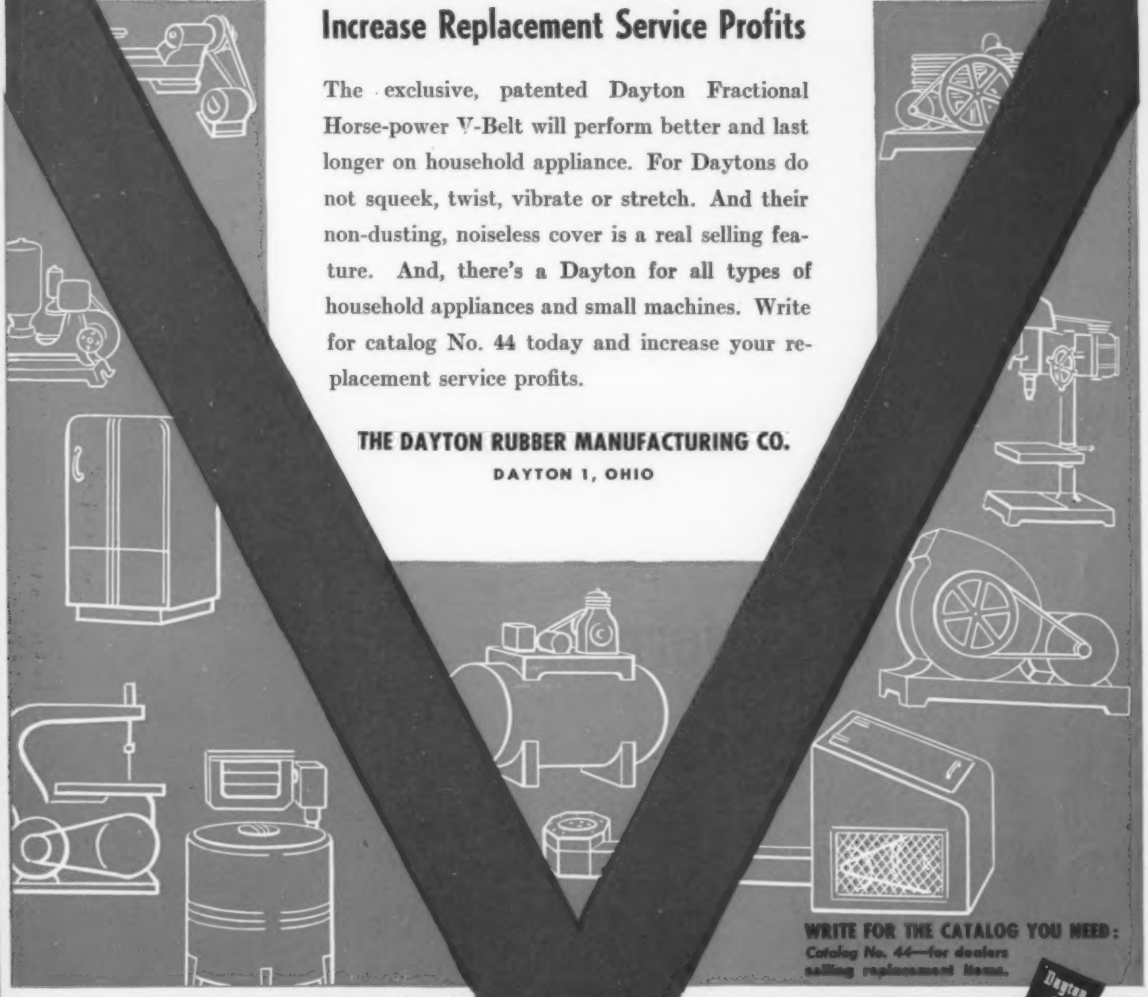
Increase Replacement Service Profits

The exclusive, patented Dayton Fractional Horse-power V-Belt will perform better and last longer on household appliance. For Daytons do not squeek, twist, vibrate or stretch. And their non-dusting, noiseless cover is a real selling feature. And, there's a Dayton for all types of household appliances and small machines. Write for catalog No. 44 today and increase your replacement service profits.

THE DAYTON RUBBER MANUFACTURING CO.
DAYTON 1, OHIO



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Catalog No. 44—for dealers selling replacement items.

Catalog No. 150—for designers of new equipment.

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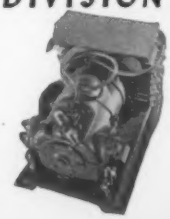
FOR REPLACEMENT SERVICE

Success... fitting diadem for superior performance

Insure yours by installing Mills Compressors and Condensing Units.

MILLS INDUSTRIES, INCORPORATED · REFRIGERATION DIVISION



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Liquid Charged...

THE NEW ALCO THERMO-LIMIT VALVE

It may be placed anywhere in the refrigeration system, at any temperature, in any position.

The ALCO THERMO-LIMIT is a "safety" valve that limits pressure to prevent motor overload. Its design is simple. Parts are interchangeable so that pressure, capacity and super-heat can be changed in the field.

Available at your wholesaler's for smaller capacity commercial refrigeration. Ask for our Bulletin 152.

ALCO

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Designers and Manufacturers of Thermostatic Expansion Valves; Pressure Regulating Valves; Solenoid Valves; Float Valves; Float Switches.

THIS SYMBOL IDENTIFIES

Better HEAT EXCHANGE EQUIPMENT *for* AIR, GASES AND LIQUIDS

Outstanding efficiency, dependability and economy in operation are responsible for the ever-increasing popularity of d-h equipment. These advantages are proven by better performance — in **air-conditioning, refrigeration, petroleum, aircraft** and **general industrial** fields.

Scientifically designed and manufactured to highest quality standards, all units are guaranteed to give complete satisfaction.

When you think of heat exchange, think of d-h, symbol of the finest in this field for nearly four decades. If you have a special problem why not write us about it? At your service will be the largest factory in the west with complete facilities for engineering, designing and manufacturing heat exchange equipment.

d-h SINCE 1910

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A *New* LOCK
A *New* HINGE

For WALK-IN COOLERS

NOW AVAILABLE FROM AMERICA'S QUALITY MAKER OF COMMERCIAL REFRIGERATION HARDWARE

"Husky" is a mild word for this big lock. It's engineered and built for the heaviest kind of duty. The locking principle is our patented "When it trips, it grips" mechanism. Saves door-slamming . . . goes into action with finger-tip pressure. Then it takes hold with a constant, bulldog grip that seals the weightiest door. With all its massive power, it's a beautiful stream-lined job . . . finished in top-quality chrome that gleams like a mirror.

The reversible ball-bearing hinge is a worthy companion. Full specifications and prices on application. Order now for early delivery!

SPECIFICATIONS

No. 4774 Reversible Automatic Lock. Forged brass handle, extruded brass bolt, stainless steel pins, case of our special zinc alloy die-cast under hydraulic pressure.

No. 3913 Reversible Strike. Pressure-cast zinc alloy base, cast brass nose. Offsets adjustable from ¾" to 1⅜". Overall length (lock and strike), 12¼".

No. 4552 Push Rod Assembly for interior operation available on order.

No. 15375 Ball Bearing Reversible Hinge of forged brass. Offsets from 1" to 1¼". Overall length, 12¾".

Manufacturing a full line of hardware for commercial refrigerators

Grand Rapids Brass Company

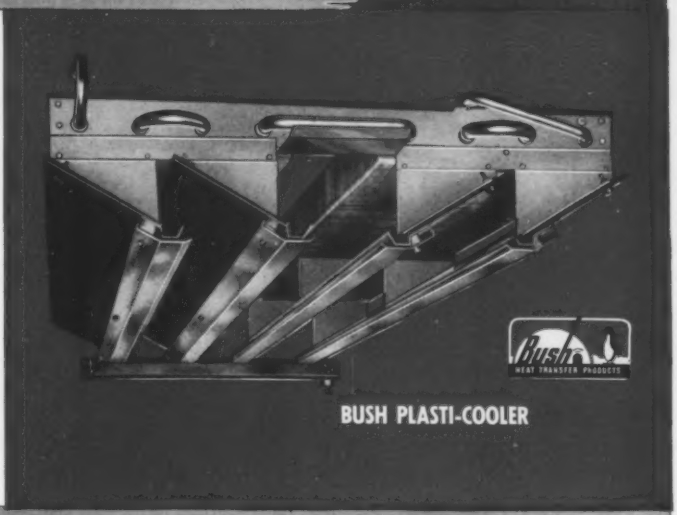
Division of CRAMPTON MANUFACTURING COMPANY

Grand Rapids 4, Michigan

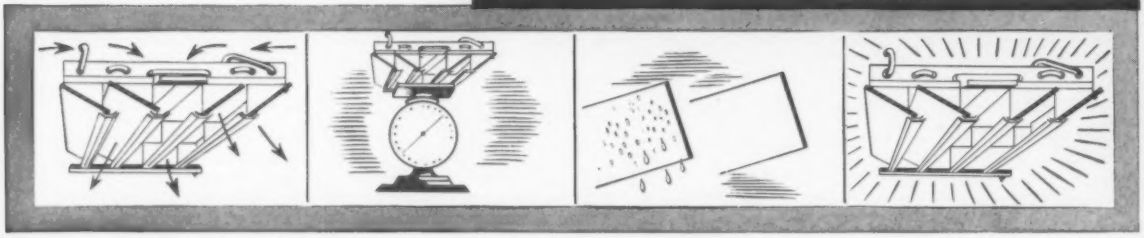
The BUSH PLASTI-COOLER *is Different*

MECHANICAL SUPERIORITY *MEANS* GREATER DEPENDABILITY

There *is* a difference . . . and it lies mainly in the superiority that is engineered . . . designed . . . and built into every BUSH unit. The wide spread preference for BUSH Heat Transfer Products is a tribute to BUSH engineering, technical skill, planning and design. That is why thousands of BUSH units are giving reliable, constant, dependable service, day after day, year after year, often under the most severe conditions, the world over. BUSH mechanical superiority has established an enviable record of dependable performance unequaled in the industry.



BUSH PLASTI-COOLER



BUSH UNITS ARE SUPERIOR *Because:*

- Baffle pitch is scientifically engineered for proper circulation of air. Baffles made of gleaming jet-black plastic.
- Extremely light — BUSH engineering eliminates bulk and extra weight. Aluminum fins mean high efficiency — minimum weight.
- Sweating eliminated by specially designed baffles of gleaming plastic which prevent condensation of moisture on the underside.
- Handsome appearance. This gracefully designed unit enhances appearance of any walk-in or reach-in box. Easily installed.

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HEAT TRANSFER PRODUCTS

Sold by Leading Refrigeration Equipment Wholesalers The Country Over

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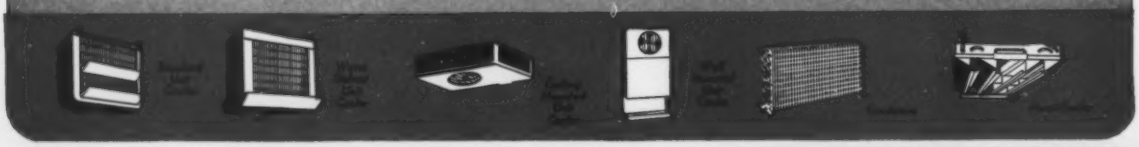
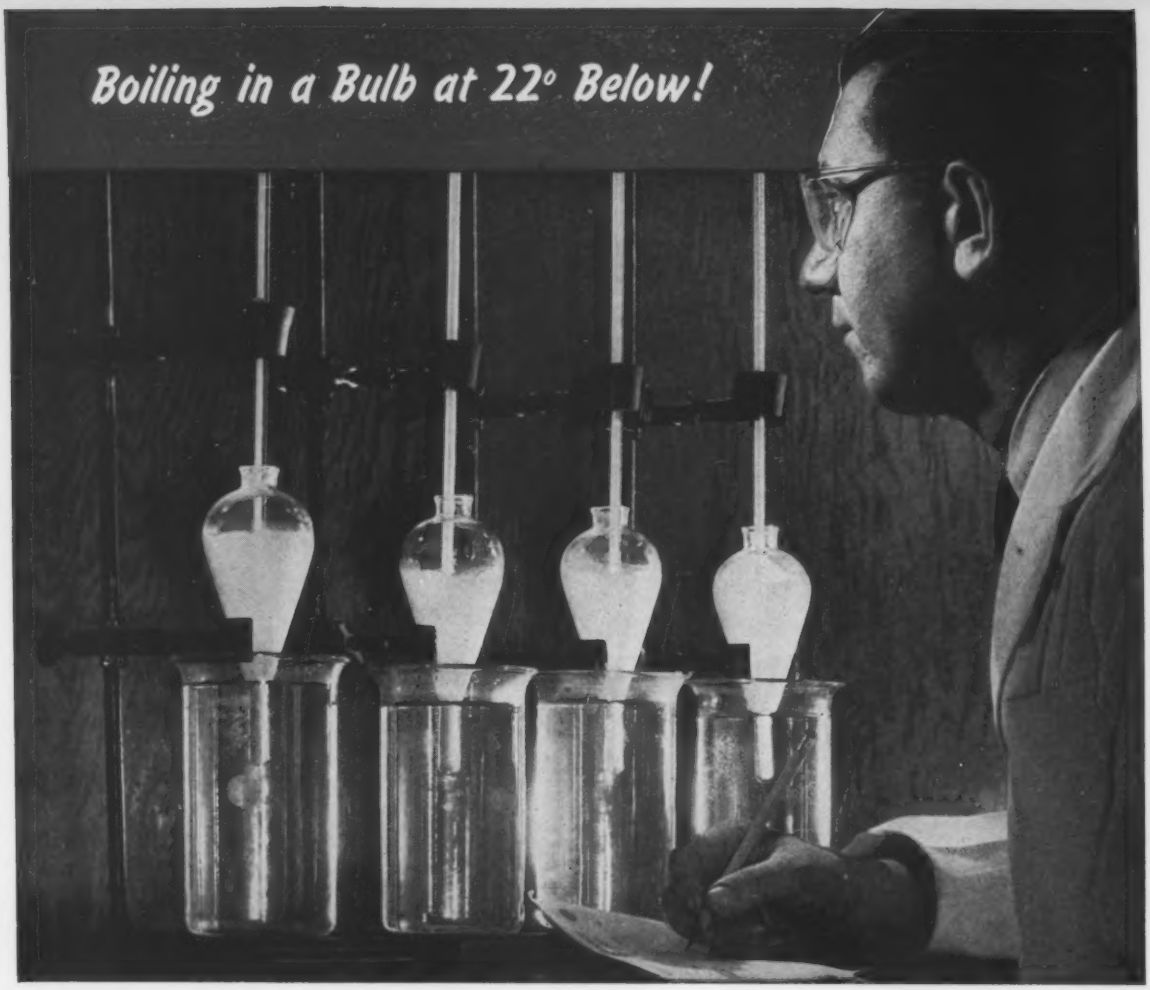


Boiling in a Bulb at 22° Below!



No 3-minute egg—this job! It's a boiling point determination test for "Freon" safe refrigerants—one of the many tests proving that each "Freon" production run meets rigid chemical and physical specifications. It guards against impurities so that refrigerating equipment using "Freon" works better and lasts longer.

It's one more test of "Freon" assuring reduced risk of oxidation and corrosion within tubing, valves, and other finely machined parts. Freezing and blocking of capillary tubes in fractional horse power units are reduced to a minimum when "Freon" safe refrigerants are employed.

The extreme purity of "Freon"... its freedom from acids... its almost total freedom from insoluble gases and moisture (less than 25 parts in a million parts of "Freon") mean long-range economy to users. "Freon" refrigerants are also harmless... non-toxic, non-flammable, non-explosive.

For compact, safe, long-lasting refrigerating systems, check the advantages of "Freon" safe refrigerants. There's a "Freon" for every job, every temperature requirement. Write for complete technical data. Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington 98, Del.

IMPORTANT FEATURES OF "FREON" SAFE REFRIGERANTS

1. Freedom from moisture... less than 25 parts per million.
2. Narrow boiling point range—confined within limits of 1/2°C.
3. Less than 2% of insoluble gases in vapor phase.
4. Freedom from acids. There are none in "Freon."
5. Freedom from impurities...less than 1/20 of 1%.

KINETIC

FREON

REG. U. S. PAT. OFF.

safe refrigerants

"FREON" IS KINETIC'S REGISTERED TRADE MARK FOR ITS FLUORINE REFRIGERANTS AND PROPELLENTS

All's Quiet—TROUBLE IS GONE!

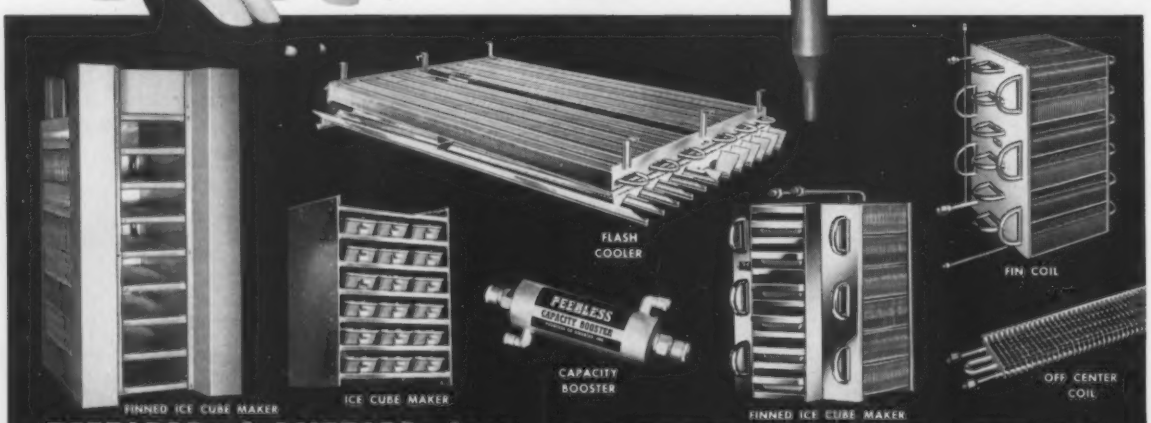
When You Use

PEERLESS
EXPANSION VALVES

With PEERLESS VL "Velvet Action" Expansion Valves in the vital control spot of a refrigeration system, breakdowns due to jerky valve movements, with resultant over-feeding and under-feeding, are eliminated. Steady, even control is maintained by PEERLESS VL Valves because of sound basic design, careful manufacture, and highest grade materials—all proven in performance. The satisfaction obtained with PEERLESS Expansion Valves is duplicated in all other PEERLESS products. For performance, it's PEERLESS!

SOLD THROUGH LEADING REFRIGERATION SUPPLY WHOLESALERS

One of the many superior features of these valves is the dependable PEERLESS Orifice Cartridge which accurately measures and governs the flow of refrigerant. Four sizes for adjustment to capacity range. Send for folder showing details of valve construction.



PEERLESS of AMERICA, Inc., 333 N. Michigan Avenue - Chicago 1, Illinois, U.S.A.

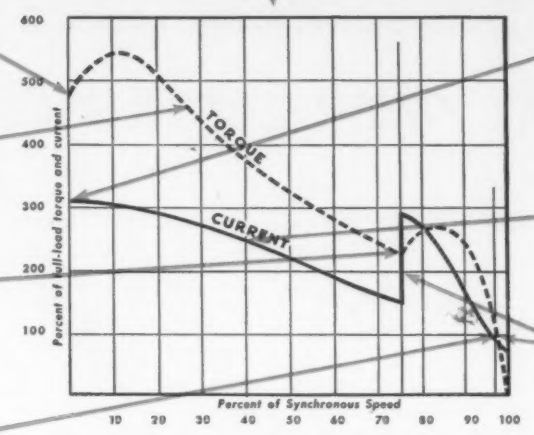
This Chart Shows Why There's Such a Strong Preference for Wagner Repulsion-Start Induction Motors

Starting-torque of the RA motor is very high—at least 3½ times full-load torque for a 4-pole 60-cycle motor—enabling the RA motor to start high-inertia loads.

Torque output of the RA motor remains high during the starting period, assuring rapid and smooth acceleration of the load.

When the torque as a repulsion motor drops to that of an induction motor, the motor is changed from a repulsion motor to an induction motor by means of an automatic mechanism built into the rotor. During the pull-in period, the torque again rises—to more than twice the full-load torque.

Full-load torque is reached at 96% to 97% of synchronous speed. *The speed decreases very little even under considerable overloads,* a highly-desirable characteristic of the Wagner type RA motor.



Typical speed-torque and -current curves of a Wagner Type RA repulsion-start induction motor. These curves show how the type RA combines the desirable features of the repulsion and induction types of single-phase motors, while it at the same time excludes their deficiencies.

Starting-current of the RA motor is lower than any other type of single-phase motor—approximately three to four times full-load current. Thus light-flicker is negligible when the RA motor starts.

Current-draw decreases rapidly and smoothly as the motor accelerates, remaining far lower than that of other types of single-phase motors.

At the change-over point where the RA motor is automatically changed from a repulsion to an induction motor, the current-draw increases—but to less than the starting-current—and then drops rapidly as the motor attains full-load speed.

The world over, Wagner type RA repulsion-start induction motors are in strong demand—and the preference for this type of motor is growing rapidly.

Fifty years ago, Wagner began building repulsion-start induction motors, and notwithstanding the development of other types of single-phase motors during the past half century, the repulsion-start induction type RA is still the preferred motor for a wide field of appliances and machines.

As the chart shows, the RA's electrical characteristics combine the best features of two types of motors: the repulsion motor while starting and the induction motor while running.

As a repulsion motor, the Wagner type RA has

1. a high starting-torque, enabling it to start high-inertia loads and accelerate them smoothly, and
2. the lowest starting-current of any type of single-phase motor, therefore least likely to cause light flicker.

As an induction motor, the Wagner type RA has

3. fairly constant and high operating-speeds at all operating loads, even under considerable overload, and
4. a fairly flat efficiency curve over a wide operating range.

This versatile motor is not only exceptionally suited for use on practically every type of motor-driven appliance and machine normally utilizing single-phase current, but is also the *only* choice for wide variety of applications.

For complete information, write for Bulletin MU-185, and address your request to Wagner Electric Corporation, 6442 Plymouth Avenue, St. Louis 14, Missouri.

Consult Wagner Engineers on all Electric Motor Problems

LOCKHEED HYDRAULIC BRAKE PARTS AND FLUID . . . NoRol . . . CoMaX BRAKE LINING

AIR BRAKES . . . TACHOGRAPHS . . . ELECTRIC MOTORS . . . TRANSFORMERS . . . INDUSTRIAL BRAKES

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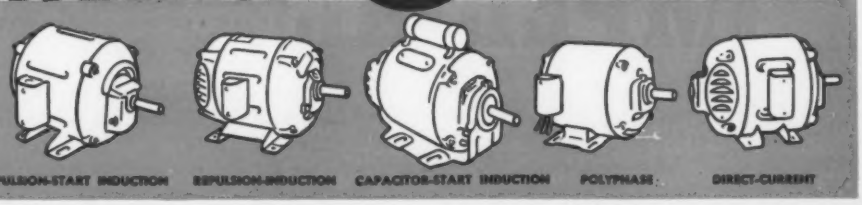


REPULSION-START INDUCTION | REPULSION-INDUCTION | CAPACITOR-START INDUCTION | POLYPHASE | DIRECT-CURRENT

ONE-PIECE COPPER SHELL Provides Greater Protection Against Leakage in the

IMPERIAL *TORPEDO* DEHYDRATOR*

Easy to refill — no bolts to unscrew, no flanges, springs or loose screens to remove before refilling. No soldering required after refilling.
Finger-type fine mesh monel metal screen, of welded construction, integral with outlet connection.
Fewer joints—assurance against leakage.
Copper and brass construction throughout.
One piece streamlined copper shell provides greater strength, easier flow of refrigerant.
Filled with Silica Gel.
Brazed — no soft solder joints that might loosen.

*YOUR BEST WEAPON IN THE WAR ON MOISTURE

Discarding old ideas of dehydrator design, Imperial pioneered the Torpedo—an entirely new dehydrator with a one-piece streamlined copper shell that provides greater strength, easier passage of refrigerant and has fewer joints. Area used for making joints is reduced to a minimum. No soft solder is used.

Another important advantage — the finger-type outlet screen — provides more efficient filtering, less chance of clogging, and easier removal for cleaning and refilling.

Copper and brass construction throughout. Packed with Silica Gel. Note the many features. *See your jobber.*

THE IMPERIAL BRASS MANUFACTURING COMPANY
536 South Racine Avenue • Chicago 7, Illinois

IMPERIAL { FITTINGS • VALVES • DEHYDRATORS • FILTERS • FLOATS • CHARGING LINES • TOOLS FOR CUTTING, FLARING, BENDING, COILING, PINCH-OFF, SWEDGING.

The Ansul Research Staff REPORTS ON . . . . .

WAX IN OIL-REFRIGERANT MIXTURES

WAX CAUSES FROZEN VALVES *too!*

These photographs show the results of practical machine tests in which 10% oil was circulated with the refrigerant. Valve temperature was approximately −25 degrees Fahrenheit. Every effort was made to exclude moisture. Within a few hours wax separated throughout the body of the expansion valve and the forepart of the expansion coil adhering firmly to the metal.

*

Ansul Wholesalers are ready and equipped to render an intelligent, co-operative service to refrigeration engineers and maintenance men on problems which arise from time-to-time in the operation of refrigerating systems.

FOR EXAMPLE:

Samples of ice machine oils, submitted by users of Ansul Refrigerants to Ansul Wholesalers, are tested by Ansul laboratories without charge by the Ansul Standard Wax-Oil Separation Method. This approved method, developed and standardized especially for use in connection with oils used in refrigerating systems, provides an accurate determination of the amount of wax which separates from an oil at low temperatures.

LIQUID Sulfur Dioxide by ANSUL* — LIQUID Methyl Chloride by ANSUL*

*REG. U.S. PAT. OFF.

A wax deposit, about 1/8 inch thick, formed on the plate carrying the ball-valve enclosure and almost completely clogged the outlet of the expansion valve.

REMEDIES

To eliminate wax trouble in expansion valves and coils:

*

1. Use an oil which separates little or no wax from its mixture with the refrigerant at the operating temperature of the valve.
2. Install an oil trap to cut down the amount of oil (and consequent wax) circulating with the refrigerant.

SEND FOR THIS BULLETIN

An informative reprint, "THE SEPARATION OF WAX FROM OIL-REFRIGERANT MIXTURES," will be sent on request. No obligation. Just address . . .

Wax deposited on the ball-valve closure plate.

Wax deposited in outlet of Expansion Valve.

Ansul refrigerants are available at leading wholesalers everywhere

ANSUL CHEMICAL COMPANY
REFRIGERATION DIVISION, MARINETTE, WISCONSIN
DISTRIBUTORS FOR KINETIC'S "FREON-11," "FREON-12," "FREON-21," "FREON-22" AND "FREON-113"

When SPECIAL Requirements Make Temperature or Pressure Control a Problem . . .

Specify White-Rodgers!

W-R STANDARD Controls have readily filled all these demands . . .

we must be able to mount the control above or below the control point

we should not have to readjust each control for altitude variations or atmospheric pressure whether installed in mountainous areas or at sea level.

if the control is in a room other than that being controlled as to temperature, we must be sure that it is not affected by the temperature in that room.

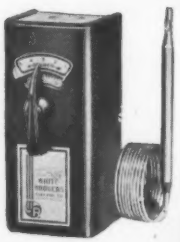
be sure that the reaction to temperature change is positive under all circumstances

have dials evenly calibrated through the entire range and clearly marked as to setting so that we can eliminate guesswork

it must have a mechanism that will stand up under the roughest kind of handling yet be sensitive to the slightest temperature variation.

contacts must close with a positive snap action. The construction of the switch mechanism must assure this

what we insist on is a uniform reaction to temperature changes no matter where it occurs within the range of the control



BY MEANS of the Hydraulic-Action principle, White-Rodgers standard controls have a flexibility of application that permits their use on many installations demanding the particular features of a custom-built control.

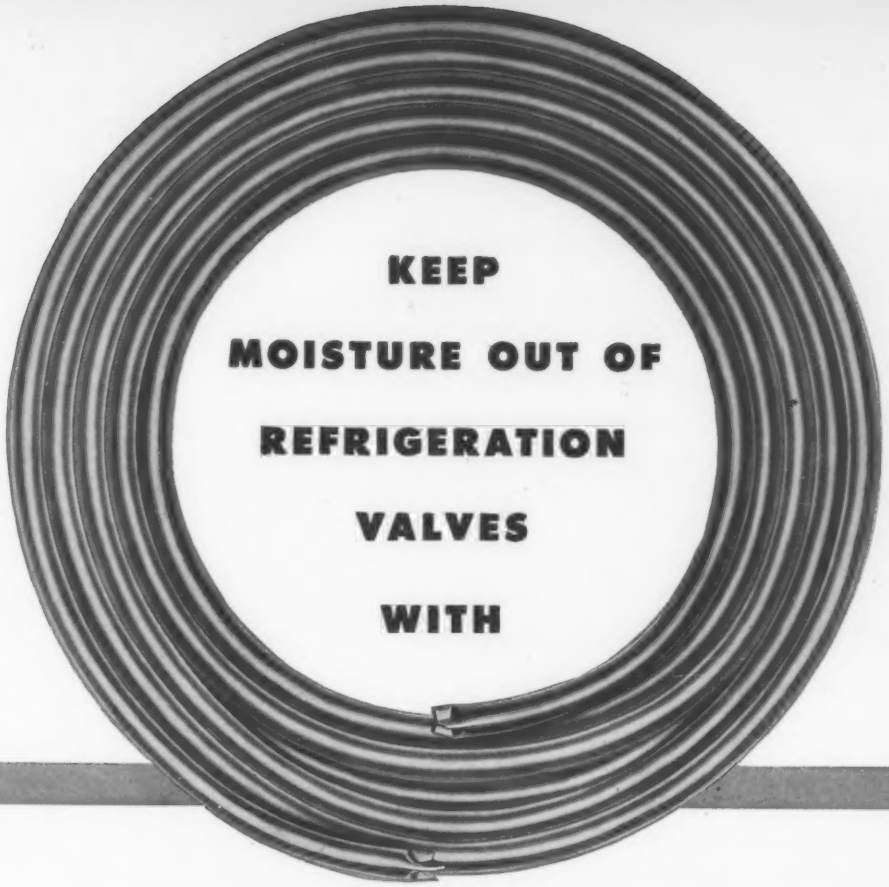
Whatever the application, when accurate control of temperature or pressure is required, White-Rodgers controls are preferred . . . by manufacturers for simplicity of installation; by service men for ease of adjustment; by all who use them for their thorough dependability.

Write for refrigeration catalog and installation data today.

WHITE-RODGERS ELECTRIC CO.

ST LOUIS 6, MISSOURI

Controls for Refrigeration • Heating • Air Conditioning



REVERE DRYSEAL TUBE

EVEN a minute quantity of moisture can cause an expansion valve to "stick"—can make a valve lose control—can freeze in the flow area of a valve and partially or wholly block the flow.

That is why Revere Dryseal Copper Tube comes to you dehydrated and sealed at both ends—so that you can keep moisture *out* of your installations.

Made for refrigeration, air conditioning, heat control, bottled gas, and other exacting services, Revere Dryseal tube is dead soft for easy handling, and comes in sizes from ⅛" to ¾" O.D., with .035" wall. It is standard in 50-foot coils. Sold by Revere Distributors in all parts of the country.

REVERE

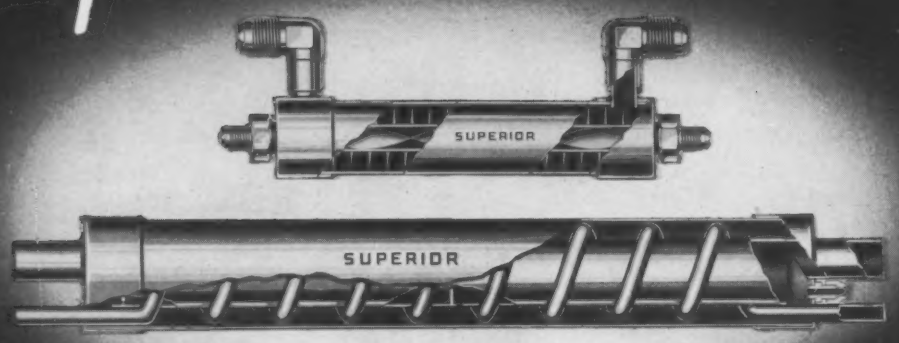
COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; New Bedford, Mass.; Rome, N. Y.—Sales Offices in Principal Cities, Distributors Everywhere

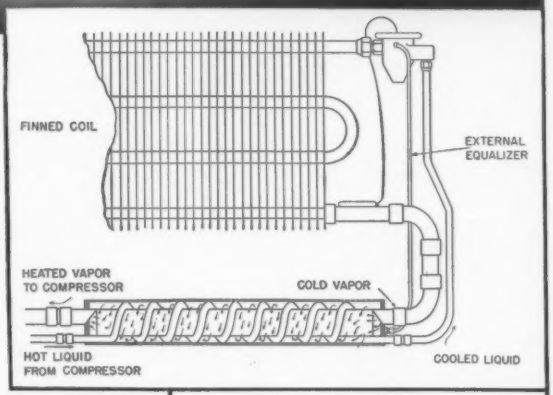
Superior ECONOMIZERS



★ ***Increase overall capacity.***

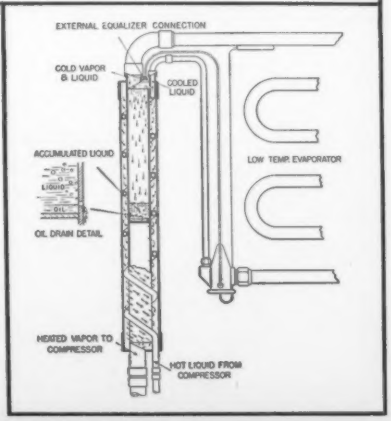
★ ***Reduce running time up to 20%***

. . . prevent sweating and frosting of suction lines, as well as oil slugging, and bring "on-the-line" jobs within the normal cycle range.



"Fractional Tonnage" ECONOMIZERS

. . . are no longer considered "unnecessary gadgets." Data now available substantiates all claims for appreciable increase in overall capacity. One should be installed in each evaporator circuit of every commercial and industrial refrigerating system. Pressure drop is negligible . . . capacity per unit size is extremely high . . . all joints are silver soldered.



"Hy-K" ECONOMIZER-ACCUMULATORS

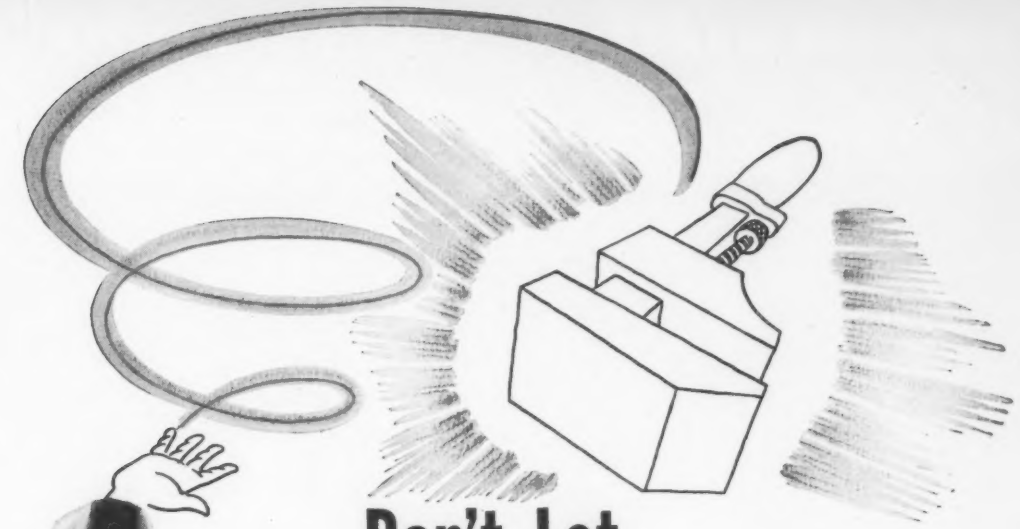
. . . have high ratio of prime to secondary, and liquid to vapor surface . . . Positive vapor contact with all surfaces . . . Maximum capacity per unit size.

"Hy-K" Economizer-Accumulators are equally suited for use in high, medium or low temperature systems.

If you haven't a copy of the new Superior Catalog R-2, request one today. No. 129

SUPERIOR VALVE & FITTINGS COMPANY
PITTSBURGH 26, PENNSYLVANIA

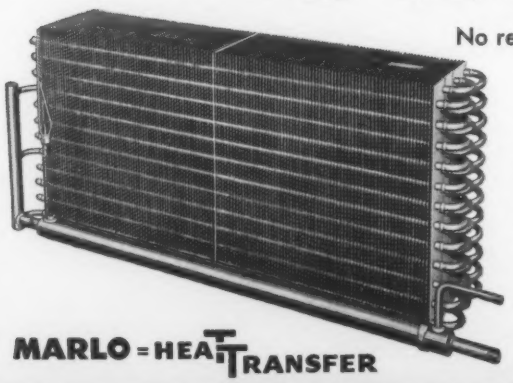
OFFICES IN PRINCIPAL CITIES • STOCKS CHICAGO (6) • LOS ANGELES (15) • JOBBERS EVERYWHERE



Don't Let DEMON HEAT Wreck A Refrigeration System!

It takes fast, efficient heat transfer to keep Demon Heat in check. He thrives on sluggish, slow heat transfer.

The performance of refrigeration equipment depends largely on the efficiency of the coils. For best results, specify Marlo **"BALL-BONDED"** Fin Coils—your guarantee of swift, high-capacity heat transfer that *stays* efficient.



MARLO = HEAT TRANSFER

No refrigeration system is better than its coils. Rely on

MARLO
HEAT TRANSFER SURFACE

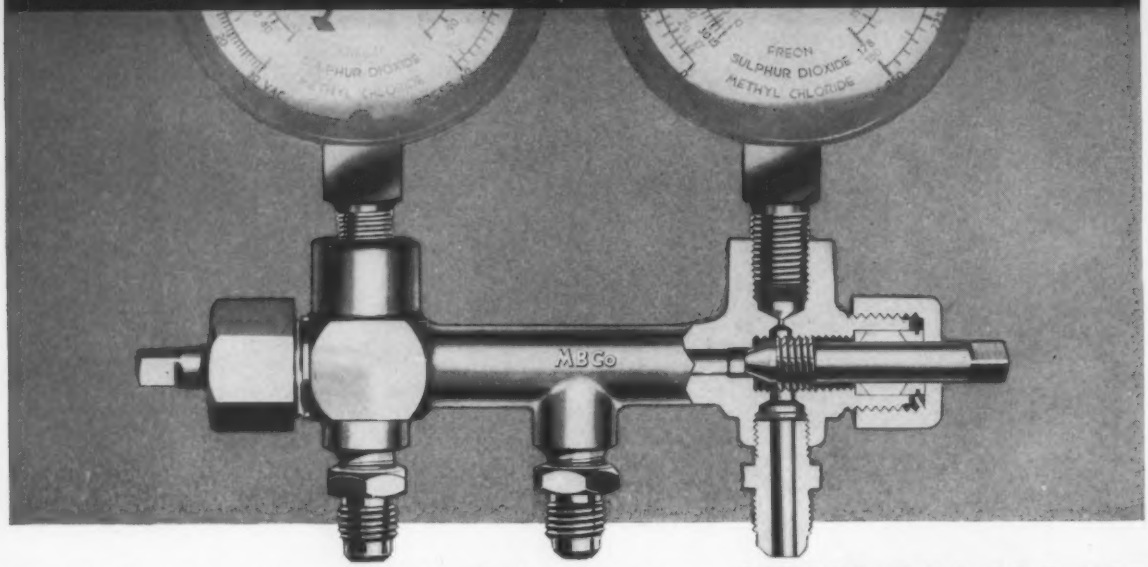
Ball-Bonded Blast Coils—Cooling and Heating • Air Conditioning and Refrigeration Apparatus • Industrial Blower Units • Unit Coolers • Evaporative Condensers and Coolers • Low Temperature Apparatus

MARLO COIL COMPANY

ST. LOUIS 10, MISSOURI

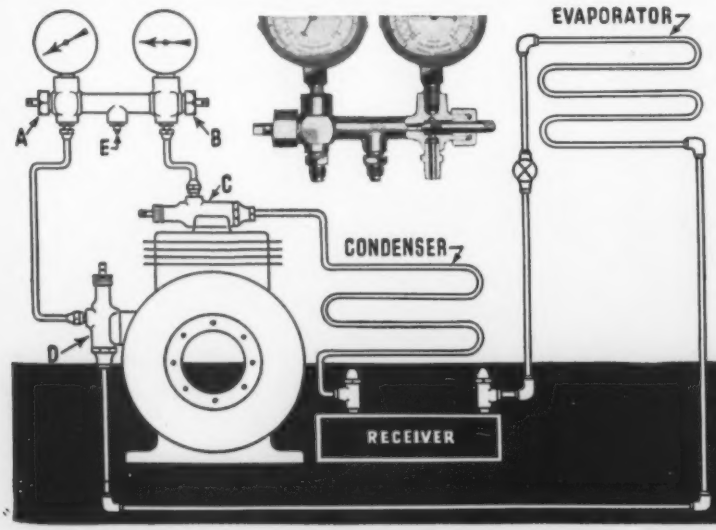
MUELLER BRASS CO. TESTING MANIFOLD

A Handy Tool for the Serviceman



The Mueller Brass Co. Testing Manifold is a service tool. It enables a service man to quickly install pressure gauges to diagnose trouble, and facilitates charging, purging, adding oil, etc.

This device allows the service man to watch the pressure gauges during charging and purging. It saves considerable time on almost any service work that must be done on the compressor.



DIRECTIONS FOR USE

1. To Observe Operating Pressures

Valve A—Closed Valve C—Back Seat Cracked Open
Valve B—Closed Valve D—Back Seat Cracked Open

2. To Charge Refrigerant Through Compressor

Connect Refrigerant Drum to E
Valve A—Open Valve C—Back Seat Cracked Open
Valve B—Closed Valve D—Closed—Front Seated

3. To Purge Receiver

Connect Purge Line to E
Valve A—Closed Valve B—Open
Valve C—Back Seat Cracked Open

4. To Charge Liquid Into High Side

Connect Refrigerant Drum to E
Valve A—Closed Valve B—Open
Valve C—Mid Position

5. To Build Up Pressure in Low Side for Control Setting or to Test for Leaks

Seal E with Seal Cap
Valve A—Open Valve C—Back Seat Cracked Open
Valve B—Open Valve D—Mid Position

6. To Charge Oil Through Compressor

Connect Oil Supply to E
Valve A—Open Valve C—Open—Back Seated
Valve B—Closed Valve D—Closed—Front Seated

MUELLER BRASS CO.
PORT HURON, MICHIGAN

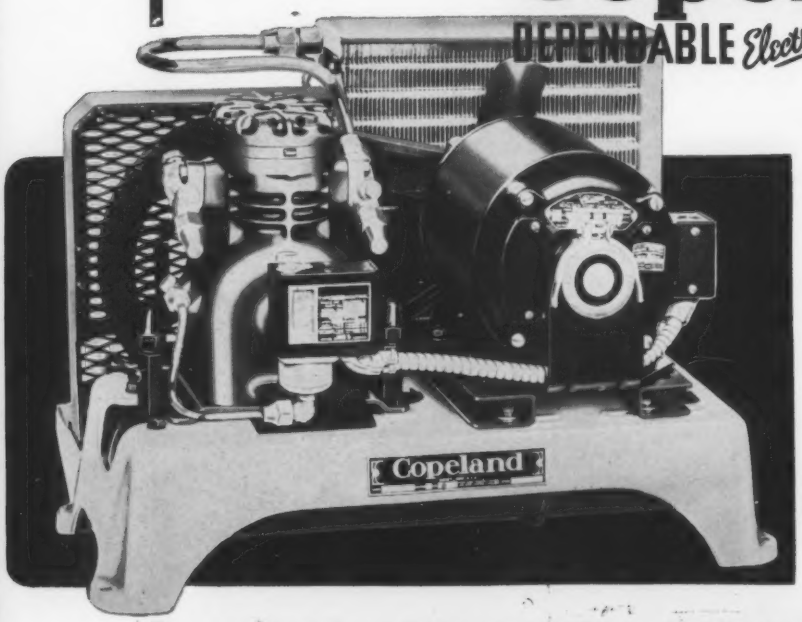
ANXIOUS...

We are as impatient as you for definite delivery schedules to be set on all the COPELAND units you want. But making specific commitments under present conditions would mean going 'way out on a limb. And we don't want your plans upset if our own production should be knocked topsy-turvy by a development beyond our control. Meanwhile, we'll continue dividing available units equitably.

Depend, too, on each COPELAND unit being topflight, just as in the past. There will be no production shortcuts at the expense of quality.

Copeland

DEPENDABLE *Electric* REFRIGERATION



BELT-DRIVEN UNITS

Copeland belt-driven units are sturdy, compact. Air-cooled models from 1/6 H.P. to 2 H.P. inclusive. Water-cooled models from ½ H.P. to 7½ H.P.

COPELAND REFRIGERATION CORPORATION, SIDNEY, OHIO

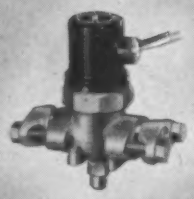
Note these Features of "DETROIT" SOLENOID VALVES

1. POWERFUL—Ample power to lift against high pressures.
2. QUIET—Design of plunger and guide tube minimizes objectionable a-c hum.
3. EASILY INSTALLED—Substantial mounting boss on valve body makes for easy, rigid installation.
4. EASILY SERVICED—Can be disassembled and cleaned without disconnecting refrigerant lines or wiring.
5. POSITIVE CLOSING—Nonmagnetic needle and seat and strong "kick off" spring assure tight closing.
6. LONG-LIVED—Valve bodies are of close-grained, non-porous cast brass. Coils are of moisture-proof construction.
7. ECONOMICAL—Draw little current. Replacement parts if required are inexpensive.

Specify "DETROIT" Solenoid Valves.

No. 682-3—This reliable valve, like all "Detroit" solenoids is designed for use with any fluid that will not attack brass. Furnished with three sizes of orifices, 1/8", 3/16" and 7/32".

Nominal capacity—liquid line
1/8" orifice 1-1/3 tons Freon 2-3/4 tons Methyl
3/16" orifice 3 tons Freon 6-1/2 tons Methyl
7/32" orifice 3-3/4 tons Freon 8-3/4 tons Methyl
3/8" female N.P.T. connections.



No. 686—The No. 686 is a heavy duty, large capacity pilot operated valve which requires a pressure drop of 1-3/4 psi to operate the piston when used with refrigerants, 5 psi on water. It is made with 2 sizes of orifices, 1/2" and 5/8". Available threaded or flanged for various size tail pipes.

Nominal capacity—liquid line
1/2" orifice 11 tons Freon 23 tons Methyl
5/8" orifice 17 tons Freon 34 tons Methyl

No. 681—The No. 681 is of the pilot operated type and requires a minimum pressure drop of 1 psi to operate the piston.

Nominal capacity—liquid line
3/8" orifice 7-1/2 tons Freon 17 tons Methyl
1/2" female N.P.T. connections.

FOUR WIRE COIL

One of the features of "Detroit" solenoids preferred by jobbers and service men is the dual 115-230 volt 4 lead coil. This coil can be used on either 115 volt 60 cycle or 230 volt 60 cycle current by connecting the 4 leads in the right sequence. Correct wiring diagram is shown right on the coil-housing—a great time saver.

DEHYDRATION FOR LOW TEMPERATURE

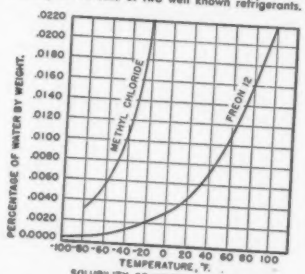
No. 11 of a Series

Moisture freezing at the expansion valve is more likely to occur in low temperature refrigeration units than in high or medium temperature units. The dew point characteristic of moist air and the solubility of water in refrigerants are factors which contribute to this likelihood. As a consequence they must be carefully considered if satisfactory operation is to be maintained. An explanation of each of these factors follows and it is hoped that this material will lead to a better understanding of the urgent necessity for very careful dehydration of low temperature systems.

Atmosphere is a mixture of dry air and water vapor, known as moist air. Each of the ingredients of moist air exerts its own pressure and the sum of the two is the atmospheric pressure. Water vapor pressure is very low and is hardly noticeable when compared to the dry air pressure. Even so there is an exact relation between the vapor pressure and the temperature at which water will boil or vaporize if originally in the liquid state, or condense if originally in the vapor state. Since water vapor under pressure is always present in the air, condensation will occur when its temperature is lowered to the saturation point. This condensation point is known as, and always referred to as the "dew point." This is not a constant value but follows the rule that the greater the percentage of water vapor in the air, the higher the temperature at which the dew point occurs. If a system is to operate at relatively high temperature, much more moisture can be tolerated, before the suction temperature gets below the dew point, and condensation occurs. In other words, a high temperature installation will tolerate a higher dew point, hence more moisture without giving trouble with freeze ups.

"Low temperature" units operate at suction temperatures between —10 deg. F. and —40 deg. F. These temperatures will run below the dew point if there is any appreciable amount of moisture in the system. When this occurs, condensation will take place and the water formed will freeze into ice at the expansion valve. Exact dew point data is not available but vapor pressures in the proximity of .005" Mercury absolute, are necessary for a dew point of —40 deg. F

Refrigerants have the ability to dissolve small amounts of moisture; the exact amount being also a function of the temperature. The curves shown here indicate this solubility in the case of two well known refrigerants. At



SOLUBILITY OF WATER IN REFRIGERANTS

any given temperature moisture in excess of the amount shown on the chart will precipitate as free moisture. The illustration, therefore, gives a measure of the extent to which a system should be dehydrated. If the evaporation temperature is —20 deg. F, moisture should be reduced to 20 parts per million.

Refrigerants themselves are not moisture free. Freon 12 as sold may contain up to 25 parts per million (the average moisture content is usually less), and reference to the curve shows that moisture precipitation would occur below —10 deg. F.

Thus a system that has not been too well dehydrated initially may be free of moisture precipitation if it is charged with an exceedingly dry refrigerant. On the other hand, a system that has been well dehydrated initially may encounter moisture trouble from the refrigerant itself when operating below —10 deg. F. The use of a dryer will minimize the possibility of moisture from either source, and the use of a dryer is recommended on all installations operating below —10 deg. F

Reprints of these articles, size 8½ x 11" and punched to fit standard 3-ring binder, are available on request. Write for your copies.

DETROIT LUBRICATOR COMPANY Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

DETROIT LUBRICATOR COMPANY

"DETROIT"

General Offices: 5900 TRUMBULL AVENUE, DETROIT 8, MICHIGAN
Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION
Canadian Representatives — RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators

PARTNERS IN PURPOSE

...to keep refrigeration systems at the height of efficiency

HIGHSIDE CHEMICALS CO.

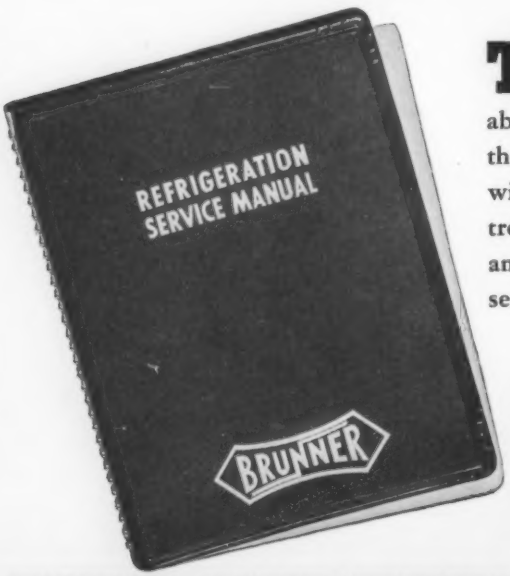
195 VERONA AVE. NEWARK 4, N. J.

Brunner Refrigeration helps you serve better

IF HEAD PRESSURE IS TOO LOW

The Brunner Refrigeration Service Manual gives the following possible causes and remedies:

PROBABLE CAUSE	TEST and REMEDY
Lack of refrigerant:	Locate leak and recharge.
Leaking compressor suction and discharge valves or broken discharge valve:	Check compressor and replace or repair valves.
Safety relief valve from discharge to low pressure side of system has opened and not reseated properly:	Open relief valve and lap seat to close and seal tightly.
Very cold room or using very cold water:	If due to cold room or cold water, this is an advantage and gives greater capacity and lower power costs.
If oil separator used, there is possibility that float may stick open and blow-by from discharge to suction may result:	Open separator and free float or replace.



THE primary essentials of service are common to all refrigeration systems. Fundamentals, such as those given above, are emphasized in the Brunner Service Manual so that the basic installation and maintenance advice given will apply to the various refrigeration systems. When trouble shooting, you will find the Brunner Service Manual an invaluable aid. If you don't have one, a copy will be sent for only $2.50. Write to:

BRUNNER

FOR MORE THAN 40 YEARS THE SYMBOL OF QUALITY

BRUNNER MANUFACTURING COMPANY, UTICA 1, N. Y., U. S. A.

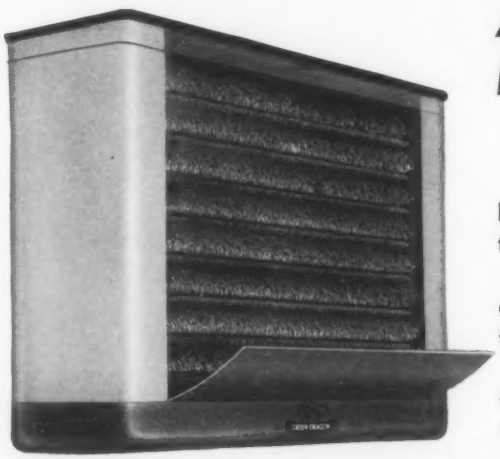
NUMBER ONE···

ELPECO
GREEN DRAGON

ON ELPECO'S HIT PARADE!

★

THE UNITRON



Flush mounted to ceiling, of course. Elpeco Thermek surface, of course. Easily removable case of sturdy, rust-proof aluminum. Scientifically brazed return-bends. Adjustable louvre. One piece, deep drawn, drain pan insulated with MICARUB. New color harmony for beauty. A star on every count.

Another Star Billing By Elpeco Wholesalers

★

Applauded by service engineers wherever it has been used, the Unitron is definitely the successor to the unit cooler.

Stardom in the low-side equipment field has been awarded the Unitron on the basis of design, performance, ease of installation, and high efficiency.

Unitrons are available in most models NOW—from your Elpeco wholesaler. There is only one Unitron. Ask for it by name.

ELECTRIC POWER EQUIPMENT CORP.

SHUNK STREET, EAST OF FRONT
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THE GREEN DRAGON ★ **GALAXY OF STARS**

★ CONDENSOTRONS
★ CUBEOTRONS
★ UNITRONS
★ EXOTRONS
★ ELPECO THERMEK
★ THERMOTRONS
★ CAPACITRONS

Their greatest critics . . . the men who test them!

No more critical eyes view PENN Controls . . . than those belonging to our inspectors and engineers. These experts are paid to find fault . . . to see that you get *the best refrigeration controls that can be built.*

With this objective in mind, PENN workers check and double-check . . . make sure that every control measures up to extremely high standards.

Here, for instance, a test engineer checks the operation of a water valve with a decibel meter to assure that the sound level meets minimum specifications.

This constant checking has paid dividends to users of PENN Refrigeration Controls . . . dividends in long, dependable service. Ask your jobber about them. You'll find controls available for temperatures as low as −150° F., and for pressures as low as 28″ vacuum.

Remember, the *extra value* you get in PENN Controls involves *no extra cost! Penn Electric Switch Co., Goshen, Ind.* Export Division: 13 E. 40th Street, New York 16, N. Y., U. S. A. In Canada: Penn Controls, Ltd., Toronto, Ontario.

PENN

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

BTU's

News • Laws • Trends

● **Frozen Foods in Combat.** A new distribution plan for feeding troops in combat areas dependent upon the general use of frozen and refrigerated foods has been evolved by a staff conference which took place in Washington recently. New ration items, revised plans of packing and shipping foods and redesigned field refrigerators are part of the general plan. Authors include a number of engineers experienced in army refrigeration problems, headed by Lt. Col. Allan N. Johannsen as chairman of a special committee on refrigeration.

● **What Strikes Cost.** Speaking recently before the Edison Electric Institute sales conference, C. S. Peare, General Electric vice president, said that the strike at G-E alone had cost the public 67,000 household refrigerators this year. In fractional horsepower motor production, the company expects to produce twice as many units this year as in 1940.

● **New Ice Maker.** A new ice-making method, developed at the University of Texas Refrigeration laboratories, is said to enable ice to be produced cheaper and almost 100 times quicker than by existing commercial processes. Experiments, it is said, have shown that ice can be made for about 5 cents per 100 pounds, and inventors of the machine believe it can be manufactured for as little as $700, complete with its source of refrigeration. The unit can produce ice in three forms: flaked, coarse crushed, and solid ice cakes. The new machine reverses the existing process for freezing ice; it freezes from the inside out, rather than from the outside in. Developers of the machine are John. R. Watt, Dean W. R. Woolrich and Dr. Luis Bartlett.

● **Liquor Clean-Up Campaign.** Wide possibilities for refrigeration and air conditioning equipment business are seen in the campaign recently inaugurated by the Licensed Beverage Industries, Inc. to encourage retail liquor dealers to clean up, renovate and maintain licensed premises in an orderly, courteous and quiet manner. The idea is that what retail liquor outlets look like, inside and out, will have a lot to do with the esteem in which the public holds them.

Some idea of the potentialities for refrigeration and air conditioning equipment in this market may be gained from statistics which show that there are in the U.S. some 111,300 establishments where liquor is sold by the drink, and 37,000 package liquor stores.

● **Priority Plans Can Backfire.** Typical of the experience of many dealers who have set up "priority plans" for allocating deliveries of household refrigerators, home freezers, and similar electrical appliances when they become available is that of a midwestern retailer, who has had so much grief with the system that he's decided to drop it entirely.

The two biggest drawback's to the plan's success, in this dealer's experience, were: (1) when one "priority" customer received his refrigerator, a flock of others called up, angrily demanding why they weren't receiving theirs; (2) in other cases, the dealer, when he received the equipment, found that many of his so-called "preferred customers" weren't in the market at all right now—their registrations didn't mean a thing. Now the dealer is back on a "first come, first served" operation, and everybody's happy.

● **How Much Do They Buy?** Home delivery sales of frozen foods average about $5.50, against over-the-counter sales averaging about $1, according to figures compiled recently by one organization in the frozen foods sales field. This seems to indicate that a tie-up between food sales and home freezer sales has definite advantages, if frozen foods are to reach their widest usage in the home. To be a quantity buyer, the homeowner has to have more than his present household refrigerator affords in the way of frozen storage space.

● **Frozen Meals Go Flying.** Transatlantic clippers on the Pan American World Airways routes are now serving pre-cooked "frozen meals" to passengers, marking the introduction of this food-serving technique to civilian airlines. The packaged meals, prepared by the Maxson Food System, are placed aboard the clippers just before departure, in pre-chilled balsa-wood boxes, covering with stainless steel, in which they can be kept frozen for 48 hours (or longer, if dry ice is used). Galley equipment on the airliners includes two electric ovens which produce 12 ready-to-eat meals every 15 minutes.

The "frozen meals" saves about 65 pounds over the former method of storing meals in thermoses, and allows space for between-meal snacks and "seconds".

● **As You Like It.** Quick-freezing, applied to such native Hawaiian products as fresh pineapple, papaya and mangoes, is expected to bring these fruits to American dinner tables in a form more delicious than is now available, and at a price within reach of the average family. One or more plants already established on the Islands are already freezing fresh pineapple in two ways: whole, just as they come from the fields, or sliced and packaged. Because of savings in both weight and shipping space, the packaged product is expected to constitute the bulk of export shipments.

The frozen product looks and tastes just like the field-ripened fruit, and is said to be much more delicious than the familiar canned variety.

Papaya, a fruit prepared and served like cantaloupe, is green and pear-shaped, about the size of a pepper squash. The meat has a pinkish orange color and a delicious, delicate flavor. Mangoes, which grow wild, are a thin-skinned, pulpy fruit, similar in flavor to the banana and the pineapple.

and now ROTARY SEAL offers this unconditional GUARANTEE with every unit!

Guarantee

ONE YEAR UNCONDITIONAL GUARANTEE

Each Rotary Seal Replacement Unit is guaranteed *for one year* to be free from defects in material and workmanship and to give satisfaction when handled and installed according to our instructions.

Any unit not proving satisfactory during the guarantee period can be exchanged by your jobber. The *complete unit* must be returned.

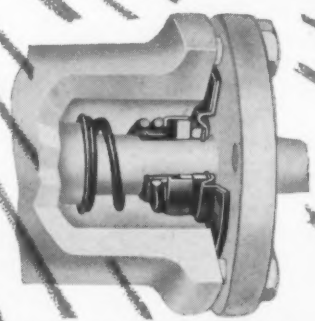
ROTARY SEAL COMPANY
2020 N. Larrabee Street
Chicago 14, Illinois

If we didn't have such complete confidence in the construction and operation of ROTARY SEALS we couldn't afford to give the above one year unconditional guarantee.

So sure are we, however, that every unit is DESIGNED RIGHT, BUILT RIGHT and OPERATES RIGHT that we offer the trade this sensational warranty of complete satisfaction and freedom from defect in material and workmanship.

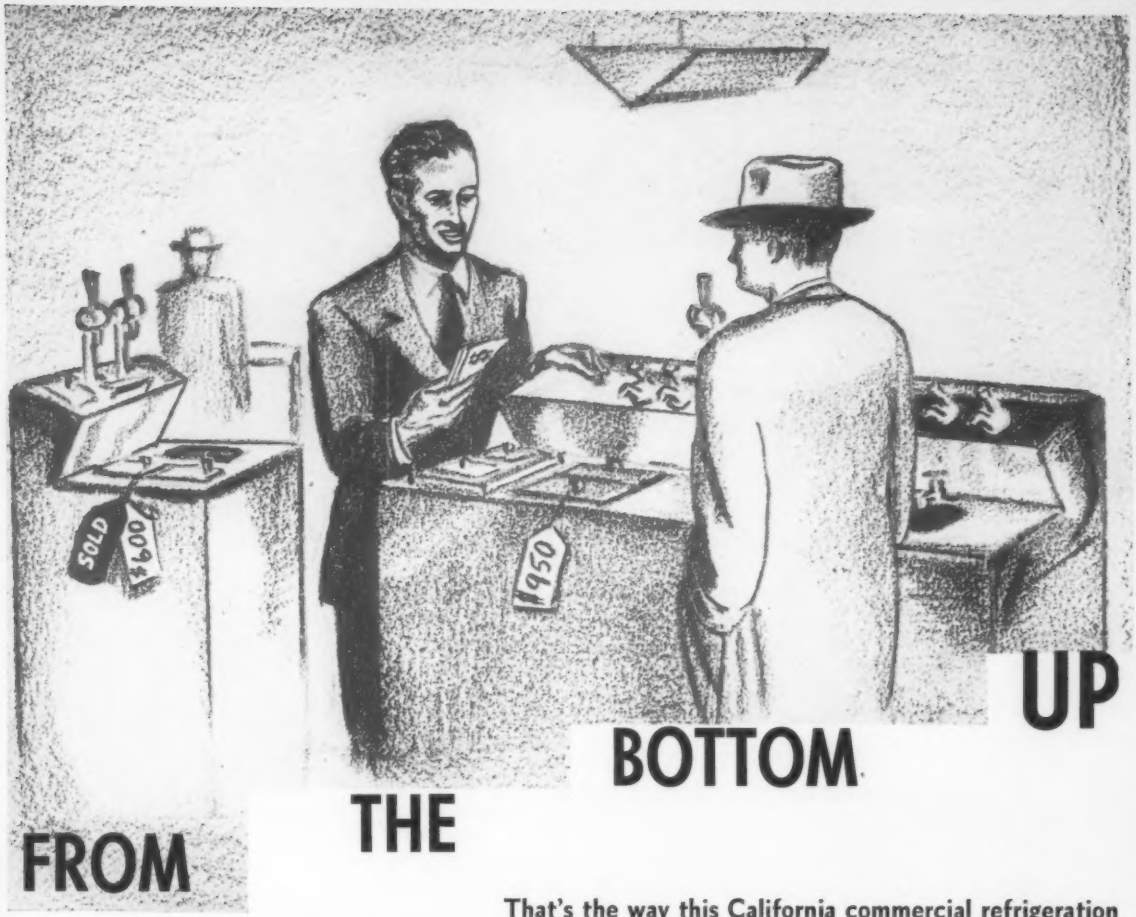
ROTARY SEALS are backed by seventeen years of precise manufacture and their reputation is famous the world over. The steady yearly increase in sales of ROTARY SEALS indicates how well they do their job.

AVAILABLE FROM YOUR JOBBER



Besides being the leading choice of so many service organizations, ROTARY SEALS are widely used as original equipment by many discriminating manufacturers.

ROTARY SEAL COMPANY
2020 North Larrabee St. Chicago 14, Ill.
Canadian Office 182 Victoria Avenue, Montreal 6, Quebec, Canada



FROM THE BOTTOM UP

That's the way this California commercial refrigeration dealer sells high-priced equipment . . . . but he gets cash-on-the-line for the less expensive unit first

By Robert Latimer

WHILE it is true that it is possible right now to sell the best in commercial refrigeration equipment to users tired of wartime repairs and breakdowns, the approach to the top price lines nevertheless must be handled skilfully, according to Ray Haselbo, head of Weir Refrigeration Sales & Service, Fresno, California.

"We've achieved a high percentage of top-quality, better-price installations through observing a few simple points in salesmanship" Mr. Haselbo explained.

"In the San Joaquin Valley area, where plenty of demand for fruit and other agricultural products means plenty of money flowing freely, it would appear that the grocer requiring a new frozen food case or the butcher wanting a reach-in box would be willing immediately to pay top price for the best equipment.

"Actually, however, we've found that the buyer is just as cagy and careful as before the war—and that the only way to successfully sell a $950 refrigerator with many deluxe features in place of the $600 box which will 'get by' is to follow a very carefully conceived plan of step-up selling.

Weir Refrigeration Sales & Service, with headquarters in Vallejo, California, is specializing in meeting the refrigeration needs of the small commercial user, including grocery stores, meat markets, frozen food distributors, taverns, roadside restaurants, and many other prospects.

Before equipment was available the company spent several months in surveying the market and laying its future merchandising groundwork. Three salesmen who did this initial "prospecting" are now making actual sales calls, armed with plenty of information about the needs of each prospect and backed up with photos and figures on earlier installations which now are saving money for their owners.

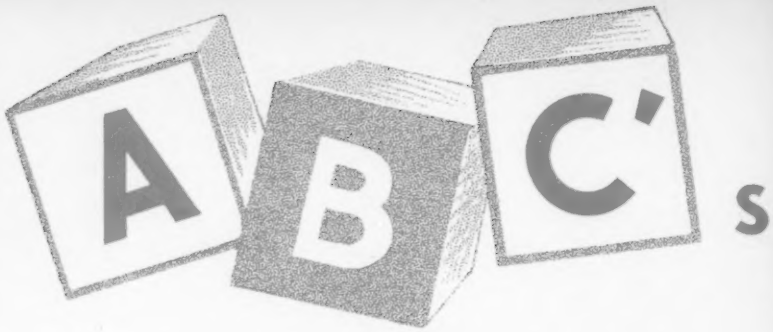
"From our experience with selling since V-J Day, we have developed a definite sales policy aimed at getting every prospect to buy the best possible refrigerator or equipment for his needs," Mr. Haselbo pointed out, "instead of merely getting by on whatever can be fitted into his building.

Continued on page 50

1—At work in the service shop, after becoming oriented to his new surroundings, the new veteran-trainee charges a refrigerant drum.

2—He listens intently as one of the shop's skilled employees tells him how to perform a simple service operation on a household unit.

3—From this same experienced worker he learns the fundamentals of servicing one type of commercial refrigeration unit.



S

The government's job-training program for discharged GI's offers benefits to the employer as well as the veteran

Part 2

DETAILS of the training program for World War II veterans signing up for on-the-job training with refrigeration service firms, like the length of such programs, will vary considerably, depending upon the scope and needs of each organization and upon the amount of training to which each veteran is entitled.

Some of these programs will include comprehensive coverage of both technical and practical aspects of the business, while others may concentrate more strongly on the mechanical side alone. A suggested outline for a rather comprehensive course of training is presented elsewhere in this article.

In any case, however, the program decided upon (as mentioned in last month's article) must be set down in written outline form and be approved by the State Board of Education.

As mentioned before, the length of the program will largely be dependent upon the extent of training to which the veteran is entitled. This is determined by the amount of time which the veteran has spent in the armed forces. Each veteran is entitled to one year of training plus the length of his military service, with a maximum of four years. And according to the provisions of the GI Bill of Rights, the entire program will be brought to a conclusion nine years after the war is officially ended.

The training program is no millstone hung around an employer's neck, however, for he is at liberty to cancel the entire program at any time, should unforeseen circumstances make such drastic action necessary.

Every care is taken, or course, to prevent this sort of disruption from occurring. No firm is endorsed as an approved training institution unless there is reason to believe that the company will be able to carry through the program to its established conclusion. But just as the veteran is guarded in this way against unscrupulous or unstable employers, so the reputable and recognized employer is protected against the possibility of being stuck with a top-heavy payroll in the face of unforeseen business adversities.

To emphasize this point, the VA recently has issued a circular stating that "no employer is expected to guarantee a job to a veteran who fails to demonstrate during the course of his training that he will merit employment. Neither is an employer-trainer expected to guarantee a position against unforeseeable circumstances which may arise and make it necessary for him to reduce his force, or at least not to expand it."

OF *On-The-Job* TRAINING

Who pays the wages of these veterans who sign up the on-the-job training under the GI Bill? The answer to that is *both* the employer and the government. Here is how the plan of compensation works.

Whenever an employer prepares a training program for a prospective veteran-employee he must set forth his plan for paying the veteran during his training period and state the "objective rate" toward which he is working. This objective rate, to be reached at the conclusion of the training program, should be the established base pay rate for a journeyman in that trade.

Starting Rate Low

But while this objective rate is that of a journeyman, actually the trainee's starting rate may be only 50 per cent of that, with stated increases scheduled at periodic intervals during his training period. A common form of advancement along these lines is a 5 per cent increase every six months.

On this basis, let us suppose that the base rate for a journeyman refrigeration service mechanic is $200 a month. At the outset of the veteran's training, then, he would receive 50 per cent of this amount, or $100. Realizing that a man may not be able to live adequately on this amount, the government then contributes $65 to the trainee, if he is a single man, or $90 if he is married.

At the beginning of the veteran's second year of training, according to this schedule (and assuming that the trainee is unmarried), the company would start paying him 60 per cent of the journeyman wage, or a total of $120 per month. The government still would be contributing the $65.

At the beginning of the third year, however, the company would commence paying the veteran 70 per cent of the established journeyman rate, or $140 per month. At this point the government's stipend would then drop to $60, for the full $65 would bring the trainee's monthly earnings to $205, or more than the base rate for thoroughly trained journeymen. And this the law expressly forbids.

So as the trainee's wage scale is gradually increased by the employer, the government's contribution drops accordingly to hold the trainee's total earnings even with those of the beginning journeyman. This process continues until the training program is terminated, at which time the trainee should commence receiving the entire $200, the beginning journeyman's rate, from the employer.

The trainee's earnings, together with his progress in his training and his attitude toward his work must be reported to the VA monthly by the employer on a form known as the "Instructor's Monthly Report on Training." Among the questions asked on this form are: Is the trainee doing good work? Is he having difficulties learning the job? Is he adjusted psychologically? Is his at-

4—The trainee is introduced to some of the problems encountered in motor repair by a mechanic skilled in that phase of service work.

5—In his spare time he applies himself to "book learning" in order to give himself a technical background for his practical work.

6—And finally he is taught "the payoff!"—the application of his service knowledge to the field of new equipment sales.

titude cooperative? Is his objective suitable? Is he making sufficient progress?

The instructor or employer then is asked to grade the trainee on each phase of the program completed. A report on absenteeism also is included.

These reports are picked up monthly by the VA's own training officers, thus providing a continuing personal contact between the employer and the VA which should be instrumental in smoothing over any difficulties and ironing out any misunderstandings which might arise during the course of the training period.

The VA will in no way interfere, however, with "existing practices" of recognized on-the-job training establishments in which veterans are enrolled. This provision was clearly stated after some training institutions had expressed the belief that VA training officers might exercise supervision over long established organizations that have carried on training courses for years.

The VA keeps far closer check on the employee than it does on the employer, for each trainee is required to submit a weekly report on the progress of his training. In this report he must itemize the work or study accomplished day by day, listing the time spent on each phase of the week's activities, and using the language of the training program.

He also is provided, on this form, with a place to itemize any difficulties he may be having with the training and to express whether or not he is satisfied with his progress. He must report on his own absenteeism, if any, and this record provides a cross-check with the attendance information reported by the employer.

The benefits of this whole program to the veteran, or trainee, are obvious. And the benefits to the employer, in terms of obtaining better qualified and more stable employees, are no less substantial or concrete. Let's look at them.

SAMPLE TRAINING COURSE

General Principles

I. Fundamentals of Refrigeration
- A. History of Refrigeration and Elementary Physics
- B. Heat, Temperature and Temperature Scales
- C. Sensible, Specific and Latent Heat
- D. Elementary Physics Problems
- E. Transfer of Heat
- F. Ice and the Elementary Refrigerator

II. Refrigerants
- A. Purpose of Refrigerants
- B. Selection of Refrigerants
- C. Refrigerants and Lubricants
- D. Substituting Refrigerants
- E. Application of Refrigerants

III. Compression System
- A. The Compression Cycle
- B. Types of Compressors
- C. Condensers and Receivers
- D. Evaporators
- E. Refrigerant Controls
- F. Motor Controls

Operation and Maintenance of the Domestic Refrigerator

IV. Compressors
- A. Reciprocating Compressor
- B. Removing and Installing
- C. Repairing
- D. Rotary Compressor
- E. Removing and Installing
- F. Repairing

V. Refrigerant Controls
- A. Expansion Valve (Pressure)
- B. Removing and Installing
- C. Repairing and Adjusting
- D. Low Side Float Valve
- E. Removing and Installing
- F. Repairing and Adjusting
- G. High Side Float Valve
- H. Removing and Installing
- I. Repairing and Adjusting
- J. Capillary Tube
- K. Removing and Installing
- L. Thermostatic Expansion Valve
- M. Removing and Installing
- N. Repairing and Adjusting

VI. Motors
- A. Fundamental Electrical Circuits
- B. Repulsion-Start Induction Motors
- C. Servicing the Repulsion-Start Induction Motor
- D. Installing Motors
- E. Capacitor-Start Induction Motors
- F. Servicing Capacitor-Start Induction Motors

VII. Motor Controls
- A. Pressure Motor Controls
- B. Temperature (Thermostatic) Motor Controls
- C. Servicing Motor Controls

VIII. Servicing Domestic Units
- A. Trouble Shooting
- B. Removing Any Part of the System
- C. Installing Any Part of the System

IX. Absorption Refrigerating Systems
- A. Wet Absorber Systems
- B. Dry Absorber Systems
- C. Absorption Refrigerator Servicing

Operation and Maintenance of Commercial Refrigeration

X. Commercial Systems
- A. Single Evaporator Systems
- B. Multiple Evaporator Systems

XI. Commercial Evaporators
- A. Natural Convection Evaporators (Include Heat Exchangers)
- B. Forced Convection Evaporators
- C. Immersed Evaporator
- D. Two-Temperature Controls

XII. Commercial Condensing Units
- A. Air and Water Cooled Units (Include Oil Traps)
- B. Types of Water Valves
- C. Servicing of Condensing Units

XIII. Commercial Refrigeration Electrical Systems
- A. Wiring Codes
- B. Solenoids, Starters and Thermostats
- C. Servicing Electrical Controls

XIV. Servicing Commercial Systems
- A. Diagnosing Troubles
- B. Removing Any Part of the System
- C. Installing Any Part of the System

Aptitudes Checked

In the first place, every veteran applying for on-the-job training is carefully screened. At a college selected by the VA he is subjected to a series of intelligence and aptitude tests which indicate rather conclusively just what type of work he may be capable of performing satisfactorily. Then he is authorized to train for those positions for which he is deemed qualified. In that way the VA serves as a super-select employment agency, and can assure the employer with reasonable certainty that the veteran who comes to learn his business has the capacity to do so.

Not only does the VA see to it that each veteran is reasonably well qualified for the job for which he undertakes to train, but it also keeps a close check on him while he is undergoing this training. In addition to the weekly progress reports required of each trainee, training officers of the VA maintain close personal supervision over all veterans engaged in on-the-job training. And any trainee who consistently fails to meet his obligations to his employer and to apply himself to his training work, or who in any other way exhibits bad faith, is seriously jeopardizing his future rights under the GI Bill.

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HIGH SIDE FLOATS *in* *Low Temperature Work*

By Ed Kellie

Vice President, American Injector Co.

THE high side float is probably the simplest metering device for use in refrigerating systems. It is practically 100 per cent tamper-proof, and is both rugged and trouble-free.

A dirty system, with sludge and carbon circulating with the refrigerant, can put an expansion valve out of commission, either with a plugged screen or a choked or completely plugged seat; or the needle mechanism may become sticky and cause the valve to lose its sensitive action. The same trouble can plug a capillary, but a high side float keeps right on operating, because the dirt and sludge can settle into the bottom of the shell, and the needle and seat mechanism being at all times in the liquid refrigerant are continually being flushed and so do not become sticky.

A small amount of moisture in a system can cause a freeze-up at the seat of an expansion valve or at the outlet of a capillary tube, but since the high side float is in the hot liquid system the moisture can go on through without freezing, and since the liquid evaporates in an accumulator moisture is not separated from the refrigerant until it reaches this stage, where there are no fine orifices to be plugged with ice.

Hundreds of thousands of domestic refrigerating units using high side floats have been in operation for 15 or 20 years, and are still operating without any service through all those years.

Shortly before the war, manufacturers of ice cream cabinets had begun to use Freon-12 as a refrigerant because of its suitability for the lower temperature operation required. Several types of refrigerant control devices were used, including the high side float.

Unfortunately, most of those who tried high side float used one designed for SO_2, found it would not work on a high side float. Some, however, did not give up so easily and just simply sent in an order for "a high side float to operate on Freon-12 with a ¼ or ½ H.P. compressor," carefully explaining that an SO_2 float would not be acceptable. In response to these requests, the simplest thing happened; we checked the operating conditions of a Freon-12 charged unit, calibrated our float mechanism to suit, and the thing worked. Not only that, but we found the same float also works on SO_2 and CH_3CL.

The operation of a high side float permits uniform temperature throughout the evaporator. This can readily be understood when one considers the following facts:

The unit is charged with sufficient refrigerant to permit complete flooding of the coil. The amount of charge is not very critical, since an accumulator provides not only a boiler space for the gas to form and be drawn off through the suction line, but it also provides a reservoir in which the liquid level can be varied from, say, ¼ of its volume to ¾ of its volume.

The amount of the charge will govern the low side pressure. A system which is running at too high a low side pressure can be purged until the required pressure (and hence

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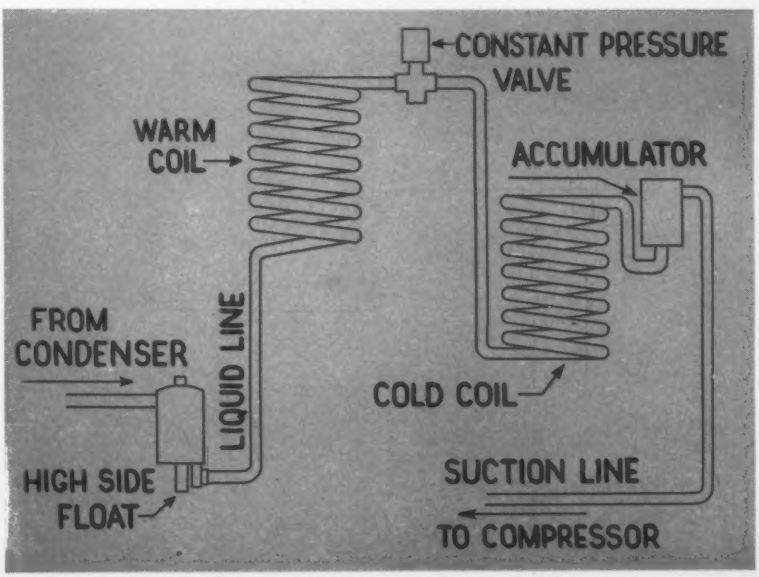
Here is a schematic diagram of a high side float as used on a two temperature installation.



COOLING FOR HUMAN COMFORT

SOURCES OF HEAT (PART 1)

By S. C. Moncher

COMFORT cooling is an important part of present-day air conditioning, and it is largely through the channels of the refrigeration industry that such equipment is sold to the user. It is hoped this series of articles will serve two purposes: (1) provide those just entering the air conditioning field with a basic understanding of the factors involved in comfort cooling; and (2) enable the trained air conditioning engineer to discuss comfort cooling applications in a non-technical language that the prospect or the customer can understand.

HOW HEAT IS TRANSMITTED: Heat may be transmitted from a substance at a higher temperature to one at a lower temperature by any or all of the three following methods: (1) conduction, (2) convection, (3) radiation. These are explained in detail below.

CONDUCTION: The most common example of conduction of heat occurs when we play a flame on one portion of a surface and thereby warm the entire surface.

Inasmuch as heat always tends to flow from a warmer to a colder level, the flow of heat will continue until a uniform temperature is reached throughout. Likewise, when air passes over a warm surface, heat is conducted from this surface to the air, although here the time of contact is usually not long enough to permit the air and the surface to come to the same temperature.

Summarizing, we may say that conduction of heat is the passage of heat through matter without any obvious motion.

Substances vary in their ability to conduct heat. Metals are good conductors, while compounds like cork, asbestos, glass wool, and mineral wool, being poor conductors, are known as insulators.

Air is also a poor conductor, as long as it is not in motion. We shall see, however, that convection currents are easily set up when air is exposed to different temperatures, so that the construction of a dead air space is well nigh an impossibility.

Inasmuch as conduction is dependent upon matter, a vacuum will be a complete insulator, although it will not prevent the radiation of heat, as we shall learn in a later paragraph.

A measure of the ability of a substance to conduct heat is given by its coefficient of heat conductivity, usually represented by the letter "K." K is defined as the quantity of

heat in BTU per hour conducted through a section of the material in question one square foot in area and one inch thick, when there is a temperature difference of one degree Fahrenheit between the two sides of the material.

The K factors for different building materials are tabulated in the "Guide" of the American Society of Heating and Ventilating Engineers, and in the catalogs of many manufacturers.

In order to determine the rate of flow of heat through a given section of material, three other factors must be known in addition to the K factor. These are: (1) the difference in temperature between the two surfaces of material, (2) the exposed area, and (3) the thickness of material. The relationship between all these factors may be expressed by the equation in Formula I.

CONVECTION: Convection is the process of transmitting heat by the actual motion of the conveying medium. This applies only to gases and liquids, and may be *natural* or *forced*.

As an example of natural convection, let us consider the action of the ordinary steam radiator, which transmits over half of its heat by this process. As the cold air in the lower part of the room comes in contact with the hot radiator, it is heated and expands, thereby becoming lighter than the air in the rest of the room.

This lighter air rises towards the ceiling, and is pushed to the other side of the room by the air which continues to rise from the hot radiator. By the time it reaches the other side of the room, however, the air has cooled somewhat and become heavier. Therefore, it falls to the floor, whence it makes its way back to the radiator for a repetition of the process.

Forced convection is illustrated when cooled air is blown by a fan through a duct and into a room, where it picks up heat. All or part

of this air is then returned by another duct to the cooling unit, where it is re-cooled and forced out into the room again.

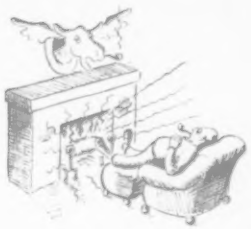
The amount of heat picked up from the room will be represented by the change in temperature produced plus the amount of moisture removed. The former represents the *sensible heat gain* of the air, while the latter represents the *latent heat gain*.

The total heat gain is best thought of as the difference between the heat content of the leaving air and the heat content of the entering air.

RADIATION: Radiation is the transmission of heat by means of invisible waves or rays. These waves will penetrate through vacuum, and do not appreciably warm the space through which they travel.

Some examples of radiant heat are: (1) the heat we feel in front of an open fire-place or steam radiator, (2) the heat given off by an electric heater, especially when provided with a reflector, and last, but not least, (3) the heat from the sun, all of which reaches the earth by radiation.

When radiant heat strikes a solid object, some of the heat is absorbed, some of it is reflected, and some of it may be transmitted through the object. Ordinarily, the darker the object the more radiant heat it will tend to absorb, while the brighter and lighter the object the more radiant heat it will tend to reflect. Trans-



parent substances, such as glass, transmit most of the radiant heat striking their surfaces.

FACTORS TENDING TO RAISE THE HEAT CONTENT OF AN ENCLOSURE: There are five main sources which tend to raise the temperature of an enclosure (sensible heat gain), and three main sources which tend to increase its moisture content (latent heat gain). These may be summarized as follows:

Sources of Sensible Heat

(1) Conduction of heat through walls, windows, roofs, ceilings, and floors, when the outside temperature exceeds the inside temperature.

(2) Radiation of heat through windows, roof, and walls.

(3) Heat from outside air introduced through infiltration, or brought in for the purposes of ventilation.

(4) Heat given off by the people within the enclosure.

(5) Heat given off by lights, machinery, stoves, equipment, etc., within the enclosure.

Sources of Latent Heat

(1) Moisture from outside air.

(2) Moisture from people.

(3) Moisture from equipment.

The first of these factors is discussed in detail below.

HEAT CONDUCTION THROUGH WALLS, WINDOWS, ROOFS, AND FLOORS: Exterior walls of buildings are normally either of wood or masonry type, and exist in a wide variety of constructions. Common masonry constructions are: (1) solid brick 8 to 16 inches thick, (2) stucco or hollow tile, wood frame, or concrete, (3) brick veneer on hollow tile, wood frame, or concrete, and (4) cut-stone veneer on brick, hollow tile, or concrete. The common wood construction consists of siding or shingles on wood frame.

Interior walls are usually con-

FORMULA I

$$H = \frac{A \times K \times td}{w}$$

H = quantity of heat conducted, BTU per hour

A = area of cross-section, square feet

K = coefficient of heat conductivity, BTU per hour per square foot per inch in thickness per degree F.

td = temperature difference between the two surfaces, degrees F.

w = thickness, inches

FORMULA II

$$U = \frac{1}{\frac{1}{f_1} + \frac{b}{k_1} + \frac{d}{k_2} + \frac{g}{k_3} + \frac{1}{a} + \frac{1}{f_o}}$$

f_1 = film coefficient for the inside surface, representing the heat conveyed from the inside surface to the air surrounding it, expressed in BTU per hour per square foot per degree of temperature difference between the surface and the surrounding air.

k_1, k_2, k_3 = coefficients of heat conduction for the several materials having thicknesses in inches of b, d, g, respectively.

a = coefficient for air space, representing the BTU conveyed per hour through one square foot of an air space of given thickness for a temperature difference of one degree F.

f = film coefficient for outside surface.

structed from plaster and metal or wood lath on studding, although plaster board, celotex, masonry, and wood veneer walls are coming into use. Each exterior wall is usually faced off with an interior wall. Often, the space between the exterior and interior wall is filled with an insulating material in order to minimize conduction losses.

A useful factor in heat conduction calculations is the *over-all heat conduction coefficient*, which represents the BTU per hour conducted through one square foot of wall, floor, ceiling, or roof of given construction and thickness, when the difference in air temperatures between the inside and outside of the wall is one degree Fahrenheit.

Due to the unlimited number of combinations of building materials possible in wall construction, it is feasible to tabulate the over-all heat conduction coefficients of only the most common types. It becomes necessary, therefore, to know how to calculate this coefficient.

The over-all heat conduction coefficient, represented generally by the letter "U", takes into account not only the heat conduction coefficients for each of the materials making up the wall, but also the coefficients for the film surfaces on both sides of the wall.

The film of air over the surface of a material presents a marked resistance to the flow of heat. Air motion over the surface decreases this resistance, thereby increasing the coefficient of heat conduction.

For outer wall surfaces, it is customary to assume a wind velocity of 15 miles per hour, resulting in a heat conduction coefficient of 6 BTU per square foot per hour per degree F., while the inner wall surface coefficient has the still air value of 1.65 BTU per square foot per hour per degree F.

The formula for calculating the over-all heat conduction coefficient, U, for a wall of any construction, is shown in Formula II.

By way of example, let us calculate the overall heat conduction coefficient, U, of an 8″ solid brick wall (4″ face brick, 4″ common brick) with an interior finish of plaster on metal lath supported by 2″ x 2″ furring strips.

Values of coefficients for individual

Continued on page 73

Sweet—and refrigerated

MANY years of experience with candy manufacturing at the Busy Bee Candy Co., St. Louis, has resulted in specifying various types of refrigeration as a "must" in the new plant now being built for the firm.

Refrigeration here will cover all phases of candy production from ingredients storing and processing to ultimate retail display, according to the management—in place of limited air conditioning and cooling which has been used in the previous Busy Bee manufacturing plant in downtown St. Louis. In the old building, a rudimentary form of refrigeration has been applied by passing brine-chilled pipes fed by St. Louis Refrigeration Service through the candy manufacturing rooms, combined with fans and insulated spaces. This system was scarcely satisfactory, according to the management, and will be replaced with modern, specific-job refrigeration in the new building.

"Our new system will begin with a 30-ton Carrier air-conditioning installation," Dan Weaver of the firm pointed out, "which will cool retail salesrooms and storage areas to a temperature always at least five degrees below normal 80° store temperatures. We have discovered that this range keeps chocolate and other candy ingredients from melting, while still maintaining temperature high enough that showcases do not show condensation to obstruct display visibility."

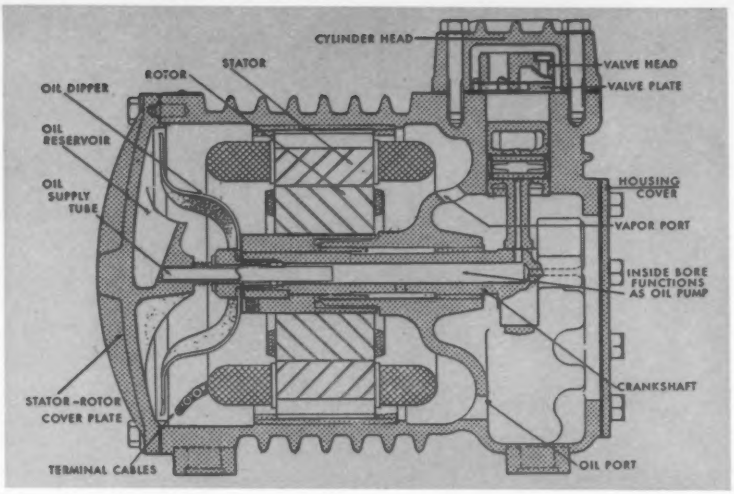
Tests in the downtown store have shown that 75 to 80° with low relative humidity are best for retail display, and that chocolate melts and loses shape at 85° or higher.

Similarly, "boosted" air conditioning will be applied to the upstairs candy manufacturing rooms in the new plant. Designed to maintain an even 70 to 75° despite 110° outside temperatures, the recirculating conditioning system under construction for the factory will be equipped with a "booster" coil and compressor to safeguard against sudden increases in temperature.

An extra 10 tons of refrigeration can be thus applied where needed at short notice, in the chocolate manufacturing rooms, in the baking area where delicate French pastries with easily-melted icings are made, and general factory areas likewise subject to heat damage. Where the major cooling system for the factory will be thermostatically controlled, there will be manual control for the booster facilities, to be used at the plant foreman's discretion.

The need for various degrees of cold, including sharp-freezing of bakery products, will be met by individual walk-in, reach-in or lid type boxes set around the plant, as well as a large low-temperature reach-in box for quick frozen items. Several will be used along the chocolate line to solve "forward stock" problems and increase production.

In the bakery section there will be dough retarders, and sharp freezer equipment capable of –40° temperatures. Busy Bee plans to enter the quick frozen bakery goods field aggressively, and will require low temperature refrigeration in all phases of this new field.



Sectional view of the single-cylinder "Coplametic" compressor used with many "Liquid" systems.

Part 7—Recommended procedure for handling "trouble shooting" work on Liquid soda fountain refrigeration systems

By J. G. Praetz
General Service Manager
Liquid Carbonic Corp.

"LIQUID" REFRIGERATION SYSTEMS

IN DOING "trouble shooting" work on soda fountain refrigeration systems, the proper gauges are essential. Pressure and compound gauges indicate the high and low side operating pressures, minimizing guess-work in diagnosing refrigeration difficulties.

Gauges are to the service engineer what the stethoscope is to the physician. If they are accurate and their readings are interpreted intelligently, they assist immeasurably in locating trouble. Always use them for this type of work.

Be sure your gauges are reliable and accurate. Handle them with care for they are delicate and easily damaged. If your gauges are inaccurate, their readings are practically worthless. Check them against a new or master gauge frequently in your service shop.

The use of gauges is a definite safety precaution. Systems having a leak on the low side should not be operated at lower than 0 lbs. pressure or on a vacuum, for this results in drawing moisture and air into the unit. The gauge will show when 0 pressure has been reached and the machine should be stopped.

In all cases of "no refrigeration" install a high and a low pressure gauge *before* running the unit. Start the compressor and watch the head pressure gauge. If the head pressure rises rapidly up beyond 250 lbs., STOP THE COMPRESSOR AT ONCE.

Pressure build-up by many refrigeration compressors is extremely rapid and, if high enough, may develop bursting pressures within the system with subsequent damage to or rupture of high side floats or receivers. On high side floats, the float balls collapse at pressures far below that required to rupture the float shell.

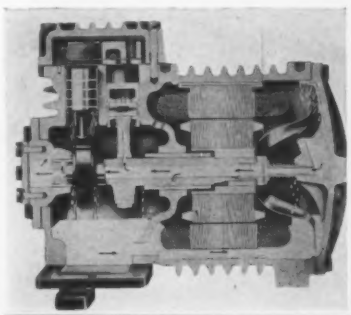
A leak anywhere on the low side of a Freon soda fountain or ice cream cabinet system would first result in loss of the refrigerant charge. Continued operation of the compressor then would result in drawing air into the system and compressing it in the high side with the possible development of bursting pressures. A *bad* leak on the low side produces a *rapid* build-up of excessive head pressure after loss of the refrigerant charge.

Compressor Efficiency Test

Both compressor suction and discharge valves must not leak if the system is to function efficiently. Compressor efficiency may be checked as follows:

1. Make sure that the compressor is warm when testing its efficiency; a cold compressor will not operate at its greatest capacity.
2. Install suction and discharge pressure gauges.
3. Raise the head pressure by blocking the air flow through the condenser (or reducing the flow of condensing water).

Continued on page 61



A cutaway photograph of the "Coplametic Twin" unit used on some "Liquid" fountain systems.

UNIVERSAL COOLER USES MUELLER BRASS CO. PARTS IN THEIR CONDENSING UNITS

UNIVERSAL COOLER

Division of INTERNATIONAL DETROLA CORP., Marion, Ohio

THESE PRODUCTS

BUILT-IN QUALITY • TIME-TESTED PERFORMANCE

Mueller Brass Co. Valves, Fittings and Accessories are sturdily and dependably built. They have a well-earned reputation for built-in quality and time-tested performance.

The Mueller Brass Co. line of refrigeration products is exceptionally complete, and all products are designed and manufactured specifically for mechanical refrigeration work. THEY ARE USED BY ALL OF THE LARGEST MANUFACTURERS THROUGHOUT THE UNITED STATES.

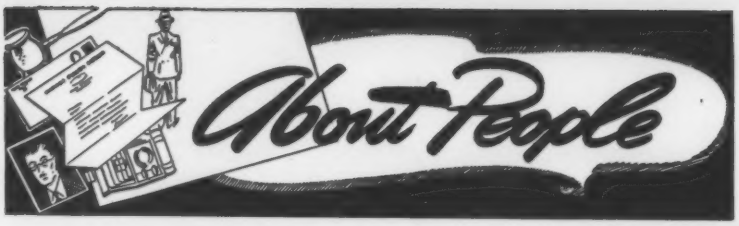
MUELLER BRASS CO.
PORT HURON, MICHIGAN

MUST BE GOOD!

Prominent in the list of nationally-known manufacturers who use Mueller Brass Company products is Universal Cooler, Division of International Detrola Corporation. One of the pioneers in the field of refrigeration, Universal Cooler is completing a full quarter century of service to many leading manufacturers of refrigeration equipment.

Since 1922, Universal Cooler has specialized in designing and manufacturing refrigeration condensing units, building a complete line of hermetically-sealed, remote and self-contained type units ranging from 1/8 to 15 h. p.

In manufacturing these refrigeration condensing units, Universal Cooler employs the most modern production methods, using modern machine tool equipment, automotive type assembly lines, complete research and design facilities and "Controlled temperature" rooms for simulating actual operating conditions in order to insure positive, accurate testing of equipment before shipment.



Lt. John V. Berger, recently discharged from the Navy, has become associated with McCombs Refrigeration Supply Co., Denver wholesaler, in a sales and engineering capacity. A graduate electrical engineer M.I.T., Lt. Berger was engaged in the refrigeration and air conditioning business in the Denver area for two and one-half years before entering the service.

●

Glenn O. Carson has been appointed western regional manager for Gotham Instrument Co., with headquarters in Seattle. Mr. Carson previously was associated with Instrument Laboratory, Inc. and Standard Boiler & Machine Works.

●

Eddy J. Miller, formerly of Servel, Inc. has been appointed assistant sales manager of the air conditioning and refrigeration compressor division of Schnacke, Inc., successor to Servel in the heavy equipment field. Mr. Miller had been with Servel since 1936, last serving as sales engineer. Since 1942 Mr. Miller has also assisted in the air conditioning and refrigeration training courses in the Evansville Evening College of Vocational Training.

●

Charles W. Stillman, formerly Coldaire Corp., has been appointed executive vice president of Orley Freezers, Inc., Detroit home freezer manufacturer. In his new capacity he will direct Orley's sales and promotion. Prior to the war Mr. Stillman directed foreign sales for Greenspot, Inc., and later became Canadian and European sales manager for Carrier Corp.

●

John Fellmann has been named central regional sales manager and **Donald L. Davidson** has been named eastern regional sales manager for Deepfreeze Division, Motor Products Corp. Mr. Fellmann, who has had over 20 years of experience in appliance manufacturing and merchandising, formerly was manager of the kitchen sales division of Edison General Electric Appliance Co. Mr. Davidson, formerly associated with Westinghouse Electric & Mfg. Co. and Crosley Corp., operated during the war as a manufacturer's agent. He will headquarter in New York.

Mr. Fellmann

Mr. Davidson

●

Three additions to the personnel of Sporlan Valve Co. have been announced. **William F. Wischmeyer** has returned to the company after more than three years with the Navy and is now heading up the company's engineering department, being in charge of design, developments, and applications. **Peter J. McCarty** has returned after more than four years in the Army Signal Corps and now is responsible for all work in connection with handling of customers' orders. **Mark D. McAnany,** a newcomer to the organization, will handle advertising, catalog work, and all other publications.

●

Roy H. Crane, sales promotion manager of Liquid Carbonic Corp., died suddenly May 24 of a heart ailment. He had been confined to his home under a physician's care since March. Mr. Crane joined Liquid Carbonic in 1926 as a special salesman in the soda fountain field. Brought to the company's headquarters as the result of an outstanding sales record in the field, he organized the sales promotion department. He then became assistant general sales manager and fountain sales manager. In 1942 he was made sales promotion manager.

●

Wynn G. Winkler has been named chief refrigeration engineer for the Parts Division of Reynolds Metals Co., Louisville, Ky. He was formerly chief refrigeration engineer for Brunswick-Balke-Collender Co. at Muskegon, Mich., and previously had been with Frigidaire and Kold-Hold Mfg. Co. in engineering capacities.

●

Bloice C. Davidson has been named general sales manager of Iceberg Refrigerated Locker Systems, Inc. Mr. Davidson formerly was sales manager for Westinghouse, refrigeration engineer with Frigidaire, and a district manager for Universal Cooler.

●

Several changes have been announced in the distributing organization of General Electric Co. **O. S. Simpson** has been appointed operating manager of the company's Pittsburgh Appliance Distributing Branch; **L. K. Ennis** occupies a like position in the Philadelphia branch;

Continued on page 51

At left are two vie
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plant's locker roo
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At right, the ch
room during co
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being complete

Want to Build

Then you've got to know
that "why," for it's just a
is a step-by-step accoun

WANT to build a locker plant? Then you've got to know what you're doing, and why. And tab that "why," Mister, for it's just as important—perhaps even more so—than the "how."

And so it's a "why," rather than a "how," story we're going to tell you now. We're using a locker plant job because it serves to illustrate our points—but it could just as well be any type of insulated enclosure.

The refrigeration contractor from whom we're taking our points, in this case, is Harry H. Spear, of Danville, Ill. Harry Spear is no newcomer to refrigeration; he's been in the business for 20 years. From a standpoint of size, he's not what you'd classify as a "big" operator; he has three installation and service men, all World War II veterans, in his organization. But his annual sales, we can assure you, compare favorably with those of many organizations employing a good many more men than he does.

Mr. Spear operates a completely equipped service shop for both commercial and household equipment. In the locker plant field, he's formed a partnership with a locker operator, who looks after the processing part of the layout while Mr. Spear looks after the refrigeration. It's proved to be a most effective combination.

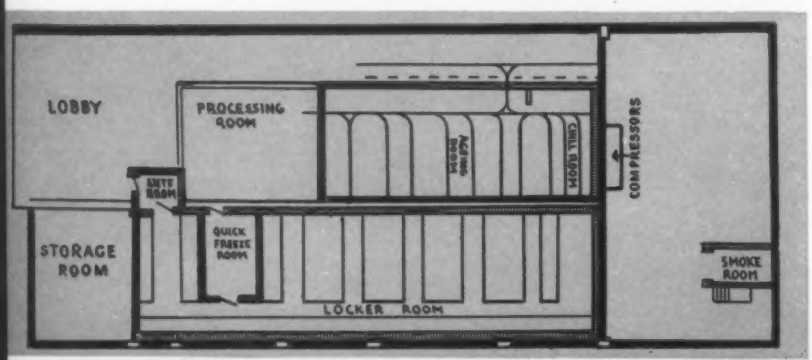
In setting up the refrigeration equipment for the locker plants he builds, Mr. Spear lays extra-heavy emphasis on insulation—heavier emphasis than any other refrigeration contractor we know of. But there's a good reason for it.

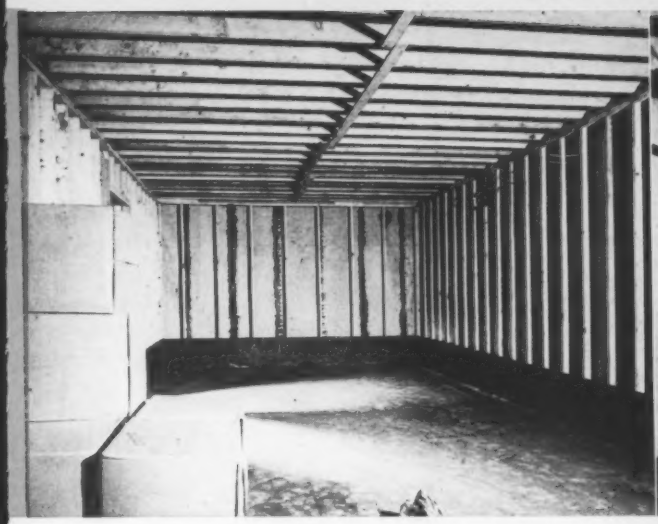
For example, let's take one of his most recently completed jobs—the Rossville Locker Co., Rossville, Ill., owned and operated by W. T. Cunningham. This plant is built to accommodate 800 lockers, and is set up to slaughter, chill out, cure and process, as well as to sharp-freeze and store meats, fruits and vegetables.

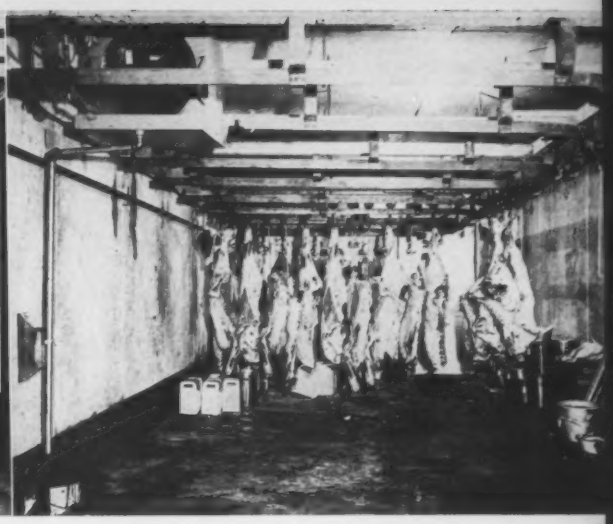
The original building was a garage. In preparing it for use as a locker plant, considerable patch-up and clean-up work was necessary before insulation could be applied. To house the locker and sharp-freeze rooms, a new building was erected on the side of the existing structure—this building was 100 feet long, 22½ feet wide. The old building was of brick construction; the new one was of concrete block.

As soon as construction was completed, insulating and vapor sealing

This diagram shows the general layout of the Rossville plant. The locker room has insulation varying from 12 to 18 inches in thickness.







Locker Plant?

u're doing, and why. Tab
tant as the "how." Here
ne contractor's methods

were started. Here's how: first, the outside walls were heavily coated with a good grade of asphalt, then the vapor seal was applied in as long lengths as was possible to handle, and the joints lapped one-third; then these joints were "buttered over" with mastic asphalt. The floor and side walls were vapor sealed in the same manner.

Next, board form insulation was used in the form of foundation piers to support the entire inner locker room construction. Loose fill insulation was poured between the board form piers. The floor joists were then laid on the piers. Six inches of Zerocel rock wool bats were placed between the joists.

The sub-floor was then laid and the inner locker room walls, studs, and plates were put up. The locker room itself has 12 inches of insulation on the floor, 14 inches on the side walls and 18 inches on the ceiling, all of Zerocel rock wool batting. Interior of the locker room is finished in rock lath.

Turning now to the "why"—why is insulation used in the amounts it is here? Here's Mr. Spear's answer:

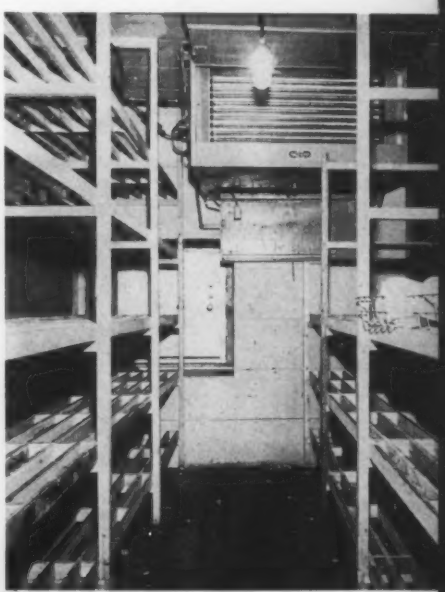
Insulation is more economical, in the long run, than bigger machines and higher power costs. The more insulation used, the greater the safety factor in case of equipment breakdown. Also, with heavier insulation, there is less wear and tear on your vapor sealing.

Vapor sealing, Mr. Spear says, is the nub of the problem of making insulation fully efficient. He tries, in jobs like this, to do as near perfect a job of vapor sealing as possible. Another practice of his (as you can discern if you've been following this carefully) is to install the maximum of insulation possible and practicable.

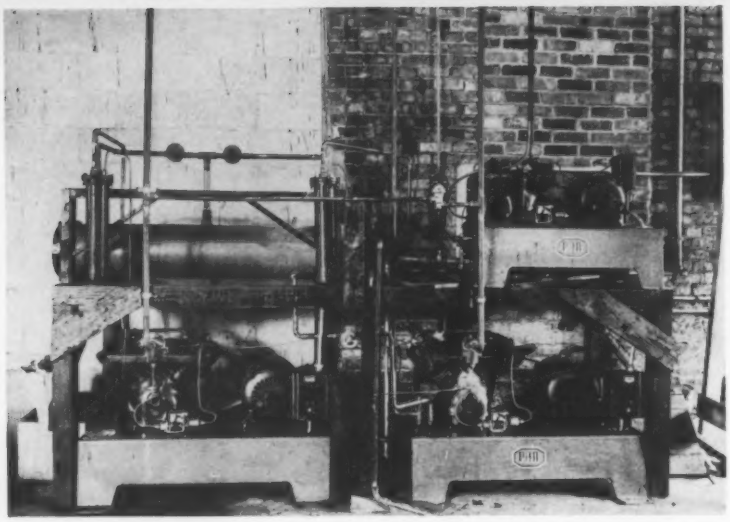
And here's another—and most important—point: have *no solid contact* between the inside shell of the room and the outside, except at the door openings. In this way, the inner shell is literally *floating* in insulation.

As far as efficiency of operation of the refrigeration system is concerned, the use of more than the usual amount of insulation will make this apparent at once, Mr. Spear says. Savings in operating costs, he says, can be figured on your decrease in wall leakage by adding insulation. Service load, however, would be the same.

Returning again to our "example" installation in the Rossville locker to be constructed was the sharp-freeze plant, the second refrigerated section room. This was set up inside the locker room, having 4-inch insulation walls. Inside locker room dimensions are 20 feet by 65 feet by 9½ feet high; freeze room size is 8 by 13 by 9½ feet.



The sharp-freeze room, shown here, has an additional 4 inches of insulation. Low temp blower unit is powered by a 5 HP machine.



Machine arrangement, showing the two 5 HP units beneath, and the 10-ton condenser and 2 HP chill room machine above. The two 5 HP units are interconnected for operating flexibility.

Next, the coils were hung and connected up in the locker room. The coils consist of approximately 2000 feet of 1¼-inch extra-heavy pipe, and are broken down into three sections and hooked up for a downward feed, using Freon-12 thermostatic expansion valves. The same coils are equipped for hot gas defrosting, using hand and check valves. The locker room is powered by a 5 HP Freon-12 condensing unit.

The locker room is lighted by fourteen 40-watt bulbs, providing ample illumination with comparatively low total wattage.

Coils were selected for the locker room for ease in defrosting, and because it was felt that their use here would allow locker patrons to use the room with a minimum of discomfort.

Temperature maintained in the locker room is 0°F., plus or minus 1°. High humidity is maintained in this room by low temperature differential between the room and coil surface temperature. Use of plenty of coil does the trick here.

In equipping the locker room, the lockers were first placed on the subfloor, after which hardwood was used to floor the aisles. Wood floor construction was used in preference to concrete because of less likelihood of customers slipping or falling. Anything that might be spilled on a hardwood floor in a zero room is readily cleaned up with a cloth and water. Lockers are six-high, the three bottom ones being drawer-type, the three top ones door-type.

The sharp-freeze room (8 by 13 by 9½ feet) is equipped with an electric defroster Krack F-19 FR low temperature blower unit, and is powered by a 5 HP water-cooled Freon-12 condensing unit. Floor of the sharp freeze room is of hardwood and the shelf arrangement, in this installation, is of wood, principally because other material was not readily available.

Bunker door opens direct from the processing room into the sharp-freeze room; service walk-in door opens direct into the locker room. The locker room has an insulated vestibule, opening direct from the office and sales room. Temperatures in the sharp-freeze room are held at from minus 5 to minus 10° F. by use of the blast cooler.

The processing room is visible from the office and sales space, and its 21 by 21 feet area is laid out for streamlined cutting up, wrapping and stamping of packages for direct transfer into the sharp-freeze room. The layout here is for straight-through handling; no back-tracking. An efficient layout is necessary to cut to a minimum the time that the produce is not under refrigeration.

Chill room, adjacent to the processing room, is 37 by 15 by 6 feet 10 inches high. The floor has 6 inches of Zerocel insulation, plus a 4-inch concrete floor well equipped with drains. Side walls have 8½ inches of insulation, the ceiling 12 inches. Inside of the chill room is finished in stonewall board, and the room has two walk-in track doors and 12 spur tracks installed in it, so that it can readily accommodate 30 head of cattle and 20 hogs.

This chill room is kept at 32 to 36° F., being served by a Krack F-12 FA blower unit, powered by a 2 HP water-cooled Freon-12 condensing unit.

Continued on page 66

Office of the Rossville plant, with the processing room visible at rear of center. Processing set-up is for straight-line operation.

REFRIGERATION INDUSTRY *News*

McCOMBS SUPPLY CO. SETS UP PLAN FOR RATIONING ITS COPPER TUBING STOCK

Because the situation on copper tubing "has reached a point where there is not much prospect of relief in the near future," McCombs Refrigeration Supply Co., Denver refrigeration supplies wholesaler, has turned to rationing to assure "fair and equitable" distribution of available supplies to its customers.

The plan, announced in a recent letter to the company's customers, involves shipping "a reasonable amount" of tubing based on a combination of the customers' estimated needs for the balance of the year and on the quantity received by the wholesaler.

SUPPLY & DEMAND

An offering of 350 refrigerators at a Montgomery Ward & Co. store in Spokane, Wash., resulted in a complete sellout within one hour. Publicity by the local newspapers resulted in the formation of a line of people that stretched around several blocks befor the store opened.

Customers received a postcard which they were asked to use to indicate the amount and sizes they would require for the rest of 1946. The customer has the right to cancel the estimate at any time. Cards will be filed in alphabetical order.

When a shipment of copper tubing is received by McCombs, the company will ship against the quantities shown on the cards, starting with "A" and so on through the alphabet. "We, of course, will not send all the tubing we receive to the first customer, even though he might have that amount or more shown on his card. We will ship a reasonable amount, based on the quantity we receive."

The company, emphasizing the need for customer cooperation if the plan is to work, makes these suggestions to customers:

"1. Do not estimate more than you reasonably expect to use this year. (Quantity shown will not be used as a basis for amount to be shipped.)

"2. Do not indicate sizes you do not normally need. For example one customer might need 1⅝" OD tubing desperately when you would not normally use that size.

"3. Remember that we do not know when we will receive shipments, how much or what size."

All back orders for tubing are cancelled by the plan, the company said, and rationing will be discontinued "when delivery again approaches normal."

* * *

COPPER SHORTAGE SLOWS INDUSTRY

A shortage in the supply of copper may further delay production of refrigeration and air conditioning equipment. Officials of Civilian Production Administration report that, due to strike conditions in many of the operations, the April output amounted to about 19,000 short tons, compared to 20,000 tons in March, 50,000 tons in February and 69,000 tons in January.

Current production is running about 25% of the January figure, with a drop to perhaps 10,000 tons foreseen for June. Mines are producing about 33% of normal production at present. Only 31,000 tons of wire bars were available for processing during April, and it is estimated that tonnage available during May dropped to 17,000 tons.

New production of refrigeration equipment and most types of home appliances is in danger of being affected, CPA says, since copper is a vital component in practically every one of them.

About 125 million pounds of brass mill products (including alloy rod and tube and copper water tubing) were produced in April about 70% of the average for the last quarter of 1945. If sufficient raw material is available, production is expected to increase, but two-thirds of the orders now being placed cannot be filled, and even with increased production, deliveries on new orders for most sizes and shapes cannot be promised before the first quarter of 1947.

Wire mill products deliveries in April were 65 million pounds, about 65% of the 1945 last-quarter production, and May production is expected to be lower, with some wire mills being forced to shut down in June due to a shortage of wire bars caused by continuing strikes at copper refineries.

Copper producers and fabricators and brass and wire mill warehouses have been asked to adopt voluntary rationing to spread the available supply as evenly as possible.

JERRY TYLER, FIXTURE HEAD, DIES FROM INJURIES RECEIVED IN HOTEL LA SALLE FIRE

Mr. Tyler

Jerry Tyler, founder and president of Tyler Fixture Corp., Niles, Mich., and a former president of Commercial Refrigerator Manufacturers Association, died at St. Lukes Hospital, Chicago, on June 9 as a result of injuries received in the Hotel La Salle fire.

He survived only a few days his wife, Mary Witt Tyler, and an only son, Michael, age 12, who perished in the fire. Mr. Tyler never regained consciousness after his vain attempt to save the lives of his family.

Mr. Tyler was born in Saginaw, Mich., Sept. 21, 1900, was graduated from Traverse City High School in 1918 and later attended the U.S. Naval Academy at

(Continued on page 44)

W. M. FULTON DIES; WAS VALVE INVENTOR

Weston M. Fulton, inventor of a device for thermostatic control of temperatures, died May 16 at his home in Knoxville, Tenn., at the age of 75.

Until 1930, Mr. Fulton headed the Fulton Sylphon Co., a manufacturing concern engaged in commercial production of his inventions, which also included a water-level recording gauge which responded to all river level changes but was not affected by waves from boats. This device is still in use by the government.

GIBSON LEASES BENDIX PLANT

Gibson Refrigerator Corp., Greenville, Mich., has leased the Bendix Aviation Corp. plant at Owosso, Mich., for a five-year period, reports the War Assets Administration. The plant will be used for refrigerator and range production and will employ between 800 and 900 persons.

ROBINSON NOW OWNS CALIF. JOBBING FIRM

Gerald S. Robinson of Seattle, Wash., is the new owner of California Refrigerator Co., refrigeration parts wholesaling firm long operated by Clarence F. (Sandy) Pratt. The company has stores in San Francisco and Oakland.

Mr. Robinson has purchased the entire stock of the organization from Mr.

Mr. Robinson

Pratt, one of the best known personalities in the refrigeration business, who is planning to retire, and to devote much of his time to his two pet hobbies, the "Outdoor Christmas Tree Association" and the distribution of baby redwood trees to his friends all over the world.

Planning to continue operations somewhat along the lines established by the former owner, Mr. Robinson has announced that Lem Branson will serve as manager of the San Francisco store and Carl Willhoft as manager of the Oakland store.

The company has purchased the building which it occupies in Oakland and is at present remodeling it so as to triple the space previously occupied. This work is expected to be completed within the next two months. The San Francisco store was remodeled and redecorated at the beginning of the year.

Released from the Navy last December as a Lt. Commander, Mr. Robinson returned to the Pacific National Bank of Seattle, which he had served for six years as vice president before entering the service.

KEROTEST ACQUIRES SECURITY VALVE

The Security Valve Division of Security Engineering Company, Inc., Whittier, Calif., a member of Dresser Industries, Inc., has been acquired by Kerotest Mfg. Co., Pittsburgh valve manufacturer, according to an announcement by Edward G. Mueller, Kerotest president.

A new manufacturing plant has been acquired at Slauson and Alcoa Avenues, Los Angeles, where the present line of Security cast and forged steel valves and Kerotest valves will be produced for Pacific Coast and western distribution.

At the same time, Mr. Mueller announced the formation of a new company, The Kerotest Pacific Co., which will be operated as a Kerotest subsidiary in order to more satisfactorily serve customers of both Security Valve and Kerotest throughout the western states.

The purchase included all of the present stocks, designs, goodwill, and equipment of the Security organization. The plant will have complete manufacturing and warehousing facilities.

Officers of Kerotest Pacific Co. are: president, Edward G. Mueller; vice president and general sales manager, Stanley J. Roush; secretary-treasurer and general manager, Walter G. Swaney.

General sales offices will be located at 3305 E. Slauson Avenue, with district sales offices in San Francisco, Houston, Chicago, Odessa and New York. Sales representatives will be located in Tulsa, New Orleans, Richmond, Va., and Charleston, W. Va.

* * *

Home of the newly organized Kerotest Pacific Co.

LAUER NAMED ACRMA HEAD

S. E. Lauer, president of York Corp., has been elected president of the Air Conditioning and Refrigerating Machinery Association for the coming year. Other ACRMA officers are:

First vice president, F. S. McNeal, president, Universal Cooler Division, International Detroit Corp.; second vice president, George S. Jones, Jr., vice president, Servel, Inc.; chairman of the board, E. T. Murphy, vice president, Carrier Corp.; vice chairman, E. B. Williams, vice president, B. F. Sturtevant Co. division, Westinghouse Electric Corp.

PARAGON CO. MERGES OFFICES AND PLANT

Paragon Electric Co., manufacturer of time controls, has announced consolidation of its main office, formerly in Chicago, with its factory at Two Rivers, Wis.

This change comes concurrently with several expansion moves required to take care of the company's growing business. The capital structure of the corporation has been enlarged by a recently consummated issue of common and preferred stock. Mr. E. V. Platt, for many years executive vice president, has been elected president.

The plant has been greatly enlarged, new machinery has been installed and all operations have been completely conveyorized. The new facilities will enable the company's output to be more than tripled, it is claimed.

A district sales office will remain at 37 West Van Buren St.

TYLER CHIEF DIES; BROTHER HEADS FIRM

Continued from page 43

Annapolis, and Colorado School of Mines.

In 1927 he founded the Tyler Sales Fixture Co., which moved to Niles in 1932 and reorganized as the Tyler Fixture Corp. in 1937.

He is survived by his parents, Prof. Leon L. and Minnie Tyler, and a brother, Robert L. Tyler. Both men are members of the board of directors of Tyler Fixture Corp., and Robert Tyler is vice-president in charge of sales.

Just as this issue was going to press word was received that Robert L. Tyler, former vice president in charge of sales for Tyler Fixture Corp., has been appointed president of the company, succeeding his brother, the late Jerry Tyler.

Jerry Tyler's prominence in the commercial refrigeration industry began shortly after his founding of the Tyler company in 1927 and continued with the growth of his firm which now maintains two modern plants in Niles, one in Cobleskill, N. Y., and another in Waxahachie, Tex.

He is credited with revolutionizing the production of refrigerated display cases, having introduced welded steel construction and assembly line methods, in the early 30's.

Mr. Tyler was also a pioneer in the home locker field, having acquired the facilities of the Harder Refrigerator Corp. of Cobleskill, N. Y., in 1944 and having introduced the "Harder Freez" home locker to the national market in 1945.

According to company officials Tyler Fixture Corp. will continue to develop the present aggressive research, manufacturing and sales program charted by Jerry Tyler.

Tyler officials include Joseph W. Krall, executive vice-president; George H. Mayhew, secretary and treasurer; Carl Eliason, vice-president in charge of national accounts; and Earl Kent, director of production. Subsidiaries in Cobleskill and Waxahachie are managed by Sam D. Vander Weg and Hal Wickham.

PRICE BOOSTS OK'd IN MANY LINES

LIFT PRICE CEILINGS ON CAPITAL GOODS, BAKER EXEC URGES

How small business is being seriously crippled by certain OPA restrictions which he called inflationary was outlined by Sterling Smith, general sales manager of Baker Ice Machine Co., Omaha, when he testified before the Senate Banking and Currency Committee. Mr. Smith's testimony also pointed up the vital necessity of commercial and industrial refrigeration to America's livelihood.

Mr. Smith stated strongly that the price ceilings on capital goods, as they affect the commercial and industrial refrigerating machinery industry, have led to serious economic distortion and low production levels in that field.

Explaining that decontrol of price ceilings on commercial and industrial refrigerating machinery would bring forth high production in that field, with a resultant efficiency in the production and processing work of refrigeration users, particularly food processors, distributors, and dealers, he termed such decontrol an important measure in the anti-inflation fight.

Mr. Smith further stated that the rise in prices of commercial and industrial refrigerating machinery would be reasonable, and that it would not affect prices of consumer goods. "Like all capital goods," he said, "refrigerating machinery must pay for itself, and more, or it will not be used."

143,000 UNITS SHIPPED IN APRIL

April shipments of domestic mechanical refrigerators jumped to 143,000 units, a new high since V-J Day and 34% above March shipments of 107,000 units, the Civilian Production Administration reports.

April shipments, however, still are only 46% of the prewar rate. Delay in reaching full production capacity is being caused by shortages of parts and supplies, CPA says.

OPA PRICES SET

* * *

Rancho, Inc.

OPA has authorized an increase of 24.3% increase in the Oct. 1, 1941 ceiling on refrigeration controls manufactured by Ranco., Inc., Columbus, Ohio. Resellers may add the actual dollars-and-cents increase in their purchase cost to their selling price on the controls.

* * *

Quillen Bros.

The 18 cu. ft. farm freezer manufactured by Quillen Bros., Indianapolis, Ind., has been assigned a retail ceiling price of $590 by OPA.

* * *

Weatherhead Co.

The Weatherhead Co., Cleveland, has been authorized by OPA to increase by 7% the maximum prices in effect on April 24, 1946 on its line of refrigeration parts. Resellers may add to their present ceilings the actual dollars-and-cents increase in the cost price of the parts to them.

* * *

Cutler-Hammer, Inc.

Cutler-Hammer, Inc., Milwaukee controls manufacturer, has been granted OPA authorization to increase the maximum prices of all its products, with one exception, by 13.8%. Product not affected is the company's line of radio switches, covered by an order issued previously.

* * *

Carrier Corp.

Ceiling price increases ranging from 9.1% to 25% for 14 types of refrigeration and air conditioning products have been granted Carrier Corp., Syracuse, N. Y., by OPA. The increases, pertaining to prices in effect on May 27, range from 9.1% for self-contained conditioners to 25% for suspension-type cold diffusers.

* * *

Norge Div., Borg-Warner Corp.

OPA has assigned a retail ceiling price of $430 on the 10 cu. ft. home freezer (model HF10) manufactured by the Norge Division of Borg-Warner Corp., Detroit.

PRICES UP 17% ON COMPRESSORS

A 17% increase in manufacturers' prices for refrigeration compressors and condensing units through 5HP capacity has been authorized by OPA, effective May 9. Repair and service parts for such equipment are granted a similar price increase.

Resellers may pass on the actual dollars and cents increase brought about by the increase in manufacturers' prices. The price increase applies to units bought at the new prices only; it may not be taken on existing stocks in resellers' hands.

The term "reseller," however, does not include anyone who purchases such equipment for use in another product (such as a refrigerator) with which it is customarily sold as a single unit at a single price.

Where a manufacturer has been given a previous "percentage" price increase on his base price, it is understood that the new increase will bring the total increase only to 17%.

In the case of resellers (distributors and dealers) the manufacturers' increase is passed on all the way down to the customer without mark-up.

Compressors and condensing units, OPA said, are made by 21 firms, but over 70% are made by five firms who make little or nothing else, and whose volume in 1941 was $18 million.

OPA recently gave manufacturers of repair and replacement parts for household refrigerators a 16.5% increase; and resellers are permitted to pass this on to their customers by applying their usual mark-up on such parts to their adjusted costs.

COOLER PRICES SET

Maximum retail prices of $660, $784 and $956 for beverage coolers of 6, 8 and 10 cu. ft. capacity produced by Milk Producers Equipment Co., St. Louis, have been authorized by OPA. Maximum dealer prices on the units are set at $396, $470 and $574.

CONTROL PRICES INCREASED 20.8%

Manufacturers and resellers of automatic electric temperature controls for heating, air conditioning and refrigeration have been authorized by OPA to raise their prices 20.8% over their Oct. 1, 1941, prices.

The action supersedes a 5% increase over Oct. 1, 1941, prices granted last October when the industry qualified as a reconverting industry.

The new ceilings, covering advances in costs and selling expenses, are expected to make possible profits to the industry comparable to those realized in the 1936-1939 base period. They were effective May 24.

Approximately 85% of all sales of the controls are made to manufacturers of other equipment who incorporate the controls in, or furnish them with their products and who include their cost in their selling prices. Sales over the counter to consumers are less than 1% of the dollar volume. Therefore no absorption by resellers is being required.

MOTOR PRICES INCREASED 16.5%

Manufacturers of electric motors have been granted a 16.5% increase in their ceiling prices by OPA, effective May 13. The increase applies to both integral and fractional horsepower motors.

Fractional horsepower motor producers previously had been allowed a 9% increase in prices last August; the new increase represents an additional boost.

McQUAY COOLER PRICES UPPED

Retail ceiling price increases ranging from $68.94 to $140.31 for four models of unit coolers manufactured by McQuay, Inc., Minneapolis, have been aproved by OPA. Consumer price increases, by models, were: Model 90—$68.94; Model 115—$91.05; Model 185—$115.72; Model 225—$140.31.

NORGE TO PRODUCE HERMETICS IN NEW TENNESSEE PLANT

Completion of negotiations for the purchase of the Air Products, Inc., Chattanooga, Tenn., plant, and Transfer of title from the War Assets Administration, has been announced by Norge Division, Borg-Warner Corp.

This brings to a total of five the number of factories to be devoted to the exclusive production of the Norge line of household appliances.

The new plant will be employed for the production of a new-type hermetic compressor unit to be used in household and commercial refrigerating devices. This output, it is stated, will augment that of the Norge factory in Muskegon, Mich., considered inadequate to meet the firm's full requirements when peak appliance volume is reached.

The plant's operations will be under the supervision of O. H. Shenstone, manager of the Muskegon factory, but Theron F. Gifford will be Chattanooga manager. Mr. Gifford formerly was assistant manager in Muskegon.

It is anticipated that operations in Chattanooga will be started by mid-summer, but before this is achieved it will be necessary to make substantial alterations to the plant in order to accommodate a great deal of high precision machinery. A considerable portion of the plant will be air-conditioned in order to obtain the fine tolerances required in the type of operation to be performed there.

FIRM ORGANIZED TO MAKE EVAPORATORS

Production of aluminum plate-type evaporators for commercial refrigeration applications is planned by Brazeway Co., a new firm organized in Adrian, Mich., by Allen L. Goldsmith and Charles Hickman, plant manager and superintendent, respectively, of Bohn Aluminum & Brass Corp.'s plant No. 13, which manufactures refrigeration evaporators.

The new company also plans to manufacture household evaporators in limited quantities.

Frederick C. Schnacke (left), president, and Walter H. Schnacke, vice president, of Schnacke, Inc. supervise final inspection and acceptance of the first Schnacke compressor to be completed and tested.

* * *

FOUR-CYLINDER MODEL LEADS SCHNACKE LINE

First refrigeration and air conditioning compressor to come off the line of Schnacke, Inc., the firm which a few months ago took over the heavy machinery business of Servel, Inc., is a 4-cylinder model which is applicable for 15, 20, or 25 horsepower.

An 8-cylinder model applicable for 30, 40 or 50 horsepower will be coming through in several weeks, according to Frederick C. Schnacke, president.

The units will comprise compressor, base, motor, guard, belt, etc., as motors become available, but the first units are being shipped without motors. Condensers and receivers are not being included in these units at present, but will be manufactured at a later date.

One of the advantages claimed for this line of compressors is the standardization of parts. The same sleeves, pistons, connecting rods, suction and discharge valves, etc., are being used on both models.

An additional model employing only two cylinders but using many of these same parts is being engineered for applications of 5, 7½, and 10 horsepower.

An advanced feature is a refrigerant cooled, replaceable sleeve of hardened steel ground and lapped to a micro-finish. The refrigerant, through suction, is drawn around the sleeves on its way to the cylinder, and so adds extra cooling effect to the cylinder walls. Other features are also incorporated in the design and construction of these compressors, engineered by the former manufacturer of this line.

The Schnacke firm is tooled up for large scale production, and as soon as materials and parts are more available plans call for doubling present production volume. Despite existing manufacturing difficulties, tooling up and production of first units was accomplished within five months from the start of the program. It is planned to have the complete line in production by the end of the year.

WESTINGHOUSE PLANS FOR EXPORT TRADE TO PACIFIC

To further plans for expanding export trade to Australia, the Orient, and Western South America, R. H. MacGillivray has been appointed regional supervisor of the Pacific Coast area for Westinghouse Electric International Co. with headquarters in San Francisco.

As representative of this company, foreign distributors for the parent Westinghouse Electric Corp., Mr. MacGillivray will cooperate with Pacific Coast exporters and importers in the promotion of foreign business. He will be responsible for increasing export trade volume for Westinghouse by assisting in the detailed handling of all equipment to be negotiated, sold, or installed in the Pacific basin.

REWA NOTES

Three regional groups of Refrigeration Equipment Wholesalers Association met in June. Members of Region 7 met in Denver June 7 and 8 at the Cosmopolitan Hotel; west coast members under Region 10 met at the St. Francis Hotel, San Francisco, on June 12 and 13; and members of Region 8 met June 18 at the Blackstone Hotel, Ft. Worth, Tex.

New Rewa member is Refrigeration Wholesalers, Inc., Seattle, Wash., with a branch store in Spokane. E. R. Nottingham is manager.

Resco, Inc., New Haven, Conn., refrigeration wholesaler, is now located in new quarters at 633 State St., New Haven, 11.

Refrigeration Supply Co., with headquarters at 1712 Griffin St., Dallas, has opened a new branch at 118 E. 15th St., Ft. Worth, Tex. Dewey L. Wright is manager.

Refrigeration Service, Inc., Los Angeles, has completely modernized its stockroom, the changes compromising new bins, new counters and streamlining of its service.

for TEMPERATURE*
for MOTOR OPERATION*

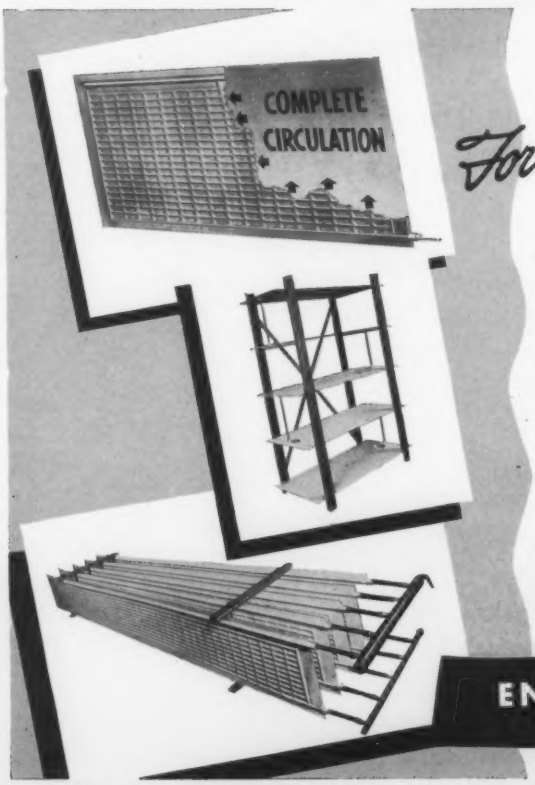
2 Recorders* for LESS than the PRICE of ONE

The TEMPSCRIBE Recorder is outstanding for its universality. Any TEMPSCRIBE can be quickly converted from temperature recording to time-operation recording simply by changing the door of the instrument. One clock case (having a 24-hour spring-wound movement) and two doors (one with a bi-metallic temperature element, and one with mechanism for recording motor on-and-off time) give you all the advantages of two separate instruments, yet cost less than you would normally expect to pay for a single instrument that makes dual records!

Popular TEMPSCRIBE styles: Temperature Ranges—minus 10° to plus 50°F. for cabinet temperature, and 40° to 100°F. for room temperature; and Motor Operation mechanism for series connection up to 250 volts. Other styles are listed in Leaflet 712.

Ask Your Wholesaler

Bacharach INDUSTRIAL INSTRUMENT CO.
7000 BENNETT STREET, PITTSBURGH 8, PA.



For Complete Surface Freezing

HUBBELL-YODER
REFRIGERATION PLATES

—and we mean "*COMPLETE* SURFACE."

Take a 19″ x 108″ Hubbell-Yoder Plate for example. That's 2052 square inches of plate area. And every single square inch is actual prime heat pickup surface. You see the interior of the plate is a network of ducts through which the refrigerant circulates, spreading out in all directions so as to form a web of refrigerating element. That's "*Complete* Surface Freezing."

If you make, sell or use low temperature equipment such as freezer cabinets, locker plant plate banks, sharp freeze shelf stacks, etc., it will certainly pay you to get details on Hubbell-Yoder Plates. They'll step up operating efficiency and reduce operating costs. As the old darkey said, "Dat am no prophecy: dat am a *fact*." Write, wire or phone.

HUBBELL YODER REFRIGERATION PLATES

International Sales Agents
ENGINEERING SERVICE INC.
1311 WEST 80TH STREET CLEVELAND 2, OHIO

HIGH SIDE FLOATS . . .

Continued from page 33

evaporator temperature) have been arrived at. After this amount of charge has been arrived at, it is usual for manufacturers to put in a weighed charge, but for service work a unit can be charged until the frost line shows on the suction line or until the latter becomes cold to the touch, and afterwards a small amount of purging is sufficient to bring the pressure down to that required.

After the unit is charged and cycling starts, the operation is simply one of the evaporated gas being drawn off and compressed and passed as liquid from the condenser to the high side float. As the load increases gas is formed faster and is passed as liquid to the high side float where it raises the float mechanism to expose sufficient orifice to permit the flow of the liquid to the evaporator at the same rate at which it is being boiled off. As the load decreases, less gas boils off and therefore less liquid goes to the float and hence less liquid is fed to the evaporator.

All of this tends to give the following results:

First: The flooded evaporator is filled with liquid which is maintained at a pressure which by all the laws of physics must be uniform throughout the evaporator and consequently the temperature must be uniform.

Second: Since gas must boil off the liquid before it can be drawn to the compressor, obviously any change in load causes immediate change in the amount of refrigerant going to the evaporator. Ambient temperature variations have no effect on high side floats because the float is governed by the amount of liquid refrigerant being fed to it, and not by pressure.

Sub-Zero Applications

In the same way, the high side float operates to provide the low temperatures necessary for home and farm freezers. On these items uniform temperature is even more important if proper freezing and storage of frozen foods is to be accomplished. In home and farm freezers the shelves or the food compartment walls or both form the evaporator. These surfaces, therefore, are most likely to be in contact with the food to be held at low temperature; consequently they must be completely refrigerated themselves, and so there is no part of the "evaporator" which can be used for superheat.

The fact that all of the evaporator surfaces (shelves or liner, or both) must be fully refrigerated makes the capillary tube metering device not too satisfactory, because it must be remembered that the amount of refrigerant passing to the evaporator is the governing factor in maintaining uniform temperature throughout. The effect of the capillary tube is to present a pressure drop between the high side and the low side.

Consequently, while the pressure drop remains constant, high side pressures will vary with varying ambient temperatures and low side pressure will vary with loading conditions. These result in varying the amount of refrigerant admitted, but a study of pressure and temperature charts taken under a variety of operating conditions indicates that the metering of the refrigerant into the evaporator does not correspond with the requirements. Consequently, uniform temperature is not possible.

Here they are

CHICAGO VALVE PLATES

For late model compressors with suction and discharge in valve plate.

MODERN DESIGN

These new Chicago Valve Plates cut cost and save work. The only valve plates with removable valve seats, they make it possible to replace only worn parts, not entire units. To take them apart, merely remove screws and pull seat out with the fingers. Valve seats are firmly held in position by a retainer bar, strongly secured to the plate. Complete range of sizes to accommodate all makes of compressors.

Write for Bulletin 545.

Ask your jobber to show you the new Chicago Valve Plates . . . also These Two Famed CHICAGO SEALS

CHICAGO COLDSPOT SEAL

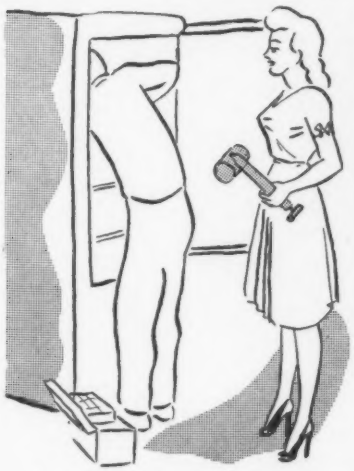
CHICAGO GENERAL REPLACEMENT SEAL

CHICAGO SEAL CO. 20 NORTH WACKER DRIVE CHICAGO 6, ILLINOIS

In other words, the capillary tube is not a sufficiently sensitive metering device, and as a result there is a loss of efficiency which shows up in longer running time than that obtained with a high side float.

In considering the use of high side floats from a service engineer's point of view, there is a considerable field for service work in replacement high side floats, also in the substitution of high side floats in place of capillary tubes on packaged units.

Concerning the possibility of using a high side float on multiple hookups, this has been done on a good number of jobs with ice cream cabinets and sweet water bath combinations, and has worked out well. It could be



"If you're trying to get the 'bugs' out, maybe this will help you."

done on dual home freezer and kitchen cabinet combinations.

The hookup, as shown in the accompanying sketch, is as follows: The high side float connects to the warmer coil. The outlet of this coil is connected to the inlet of a constant pressure valve. The outlet of the constant pressure valve is connected to the inlet of the colder coil. The outlet of the colder coil is connected to an accumulator, which is connected to the suction line. The unit is then charged with refrigerant, with the constant pressure valve set to remain open.

Charging is continued until both coils are flooded. The constant pressure valve is then set to maintain the desired pressure within the warmer coil. After the unit begins to pull down, it is purged until the desired pressure is obtained in the coolest coil. When proper pressures are obtained, the operation follows this pattern:

If the warmer coil temperature rises, it opens the constant pressure valve and dumps over into the colder coil, and the gases go through to the accumulator and thence to the suction line. If under these conditions the suction pressure rises sufficiently, the unit starts up and runs until the pressure is lowered to the cut out point.

If the colder coil temperature increases, the unit starts up and brings it down. In either case, the refrigerant is pumped back, condensed, and passed to the high side float. From there it goes first to the warmer coil to establish equilibrium there, then the constant pressure valve opens and the balance of the refrigerant goes on to the colder coil to replace that which has been drawn from that coil.

It works very well, is relatively low in initial cost, and has a good running time ratio.

Here's a very profitable item for every distributor and dealer to PUSH RIGHT NOW!

Temprite draught beer coolers lead the way to HOT volume in HOT weather!

Warm weather boosts tavern beer business but at the same time reduces the efficiency of many existing draft beer refrigeration systems! And any tavern owner, inconvenienced by equipment which cannot properly carry hot weather loads, will naturally consider reconditioning or replacing existing equipment. This is the time to push TEMPRITE draught beer coolers and dispensing units! *A TEMPRITE unit will handle hot weather demands to perfection!*

TEMPRITE CORRECTS COMMON DRAUGHT BEER TROUBLE

Warm beer, foamy beer, waste beer, unpalatable beer and slow service result in loss of money, and even more important, loss of customers who are dissatisfied. *TEMPRITE cooled draught beer is RIGHT from the beginning to the end of every keg.*

The high refrigerating efficiency, small size and special beer dispensing design make TEMPRITE units ideal for both reconditioning installations (where the condensing unit is available) or complete new installations.

Two different models are available from both the TEMPRITE factory and local wholesale distributors. *Write or wire for information on local source of supply and latest literature and prices.*

NOW AVAILABLE FOR IMMEDIATE DELIVERY

TEMPRITE PRODUCTS CORP.

Originators of Instantaneous 80° 40° *Liquid Cooling Devices*

41 PIQUETTE AVENUE DETROIT 2, MICHIGAN

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FROM THE BOTTOM UP . . .

Continued from page 29

"We want to build a reputation for trouble-free, quietly efficient refrigeration, and naturally this is best achieved through selling the best refrigeration facilities possible. This goal is responsible for the way we handle all 'grading up' work."

Grading up, at this California dealership is a routine practice which follows definite lines. Every salesman, however, has instructions to "start at the low level" when he brings his customer in to look over the Weir stock.

"Here's the theory on which we operate, in order to sell top-price units," Mr. Haselbo explains.

"When a customer comes in with his mind made up to spend a definite amount, the natural impulse is to want to grade him up. But if we overdo the presentation of the higher priced line, many customers will decide to wait awhile until they can better afford the quality job. Thus, we lost two sales at once—that of the original low price box, and also that of the higher priced one.

"So our policy is always to accept the lower priced sale, and get the cash or check, completing the transaction *before* we begin to grade up the prospect into buying a more expensive installation.

"Once we have the money tied up on the first refrigeration unit the customer decided upon, it is far easier to step him up to a better unit. In the customer's mind, the extra cost is then a new amount rather than a large initial cost, and he is far more amendable to suggestion.

Don't Talk Down

"We don't disparage the first purchase in any way, but merely point out the advantages of the better priced equipment as if the idea had just occurred to us. In this way we have accomplished one sale and have a practical footing for grading it up to a larger amount."

As an example of how well this system has worked out, more than 70 per cent of Weir's outstanding installations in the Fresno area consist of top-price refrigerator compressors, reach-ins, walk-ins, and other refrigeration.

Once the customer is successfully traded up, the papers on the initial sale are torn up and thrown away, having served their purpose.

"We'll continue on this plan as long as there is any price difference between an adequate and a superior refrigerator," Mr. Haselbo summed up. "It has proven the easiest psychological way to elevate our sales volume into the best price lines."

AMINCO OIL SEPARATORS

Aminco Oil Separators protect compressors by maintaining correct oil level in crankcase and by excluding oil from refrigerant stream they enable coils, condensers, valves and dehydrators to function most efficiently.

These oil separators are made for jobs from ½ H.P. to 120 tons and are used everywhere, ashore or afloat, where efficient refrigeration is desired.

Full descriptive bulletins on request.

AMERICAN INJECTOR CO.
1481 - 14th AVE. DETROIT 16, MICH.
Van D. Clothier, 1915 E. 16th, Los Angeles
George L. Boone, Rm. 739, 1775 Broadway, New York
W. H. Cody, Santa Fe Bldg., Dallas
Export: Borg-Warner, 310 So. Mich., Chicago

"Yes, you can store them both, Mister — but there'll be an extra charge for the lady."

ABOUT PEOPLE . . .

Continued from page 39

and **C. E. Curtis** has been named operating head of the Cincinnati branch. **Jack Dreyfuss** has been appointed acting manager of the Los Angeles Appliance Service Center to replace R. K. Peters, who died May 4.

●

Philip Hedrich has been appointed general sales manager of Universal Cooler Co. of Canada Ltd., Brantford, Ont. Mr. Hedrich has had 14 years' experience in the refrigeration industry, commencing in 1932 when he joined the sales force of C. V. Hill Co. He spent two years with Universal Cooler Corp., then later joined the Nash-Kelvinator Corp., which firm he left to assume his new position.

●

Richard T. Cragg has been appointed merchandise manager of R. Cooper Jr., Chicago G-E distributor. Prior to naval service Mr. Cragg was advertising and sales promotion manager of the Cooper organization.

●

Col. A. H. Anderson, who had been with Bacharach Industrial Instrument Co. since 1923 prior to leaving for duty with the Army in 1941, has returned to that organization as treasurer and a member of the board of directors. Because of the entry of the company into instrumentation for the refrigeration and air conditioning trades, and its expanded activities in the heating field, he will devote his entire time to the management of this division.

●

Vilter Mfg. Co. has announced four promotions among its personnel. **Albert O. Vogel,** assistant to

Available Now! These Repair Parts Fit MILLIONS of MOTORS

Every Repairman needs this Handy "On-the-Job" Assortment of Wagner Motor Repair Parts

Be a "One Tripper"—carry this kit in your car for "on-the-job" motor repairs.

It contains fast-moving parts for repulsion-start induction brush-lifting and capacitor-start induction-run motors—up to and including ½ hp.

Order for each of your men. Use coupon below. Also available at 325 authorized service stations.

Wagner Electric Corporation
6442 Plymouth Avenue
St. Louis 14, Mo.

Date_____

Gentlemen:

Please ship_____ (Quantity) Motor Parts Assortment M-1 at $8.57 each (Net) total $_____.

☐ Also send copy of Motor Parts Catalog MU-40

Company_____

Address_____

City_____ Zone_____ State_____

M46-19

Wagner WE Electric

An OPEN LETTER to REFRIGERATION CONTRACTORS

We want **YOU** ←←←

To work together . . . .

. . . To fight together

for the protection and improvement of your business

IF—You are a square shooter in business

IF—You want less unfair trade practices

IF—You want help on labor problems

IF—You want profitable ideas from others

IF—You want help on code and license matters

IF—You want to protect the investment in your business

THEN—Join with other progressive refrigeration contractors in a common undertaking

★ ★

The National Association of Refrigeration Contractors has been established to give you, for the first time, a sound national voice in these, and many other problems you meet in your day-to-day operations. Members are identified as the qualified representatives of the refrigeration contracting field in their communities.

★ DUES SCHEDULE ★

No. of Mechanics, Trainees & Helpers	Annual Dues	Initiation Fee	Total
1 - 4	$ 25	$ 5	$ 30
5 - 9	$ 50	$10	$ 60
10 or over	$100	$20	$120

NATIONAL ASSOCIATION OF REFRIGERATION CONTRACTORS

335 Hippodrome Annex, Cleveland 5, Ohio

President	Warren W. Farr	Cleveland
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☐ Enclosed is our check for dues and initiation fee.

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the president, has been named general sales manager. **Erich J. Kocher** has been appointed chief engineer, **Donald F. Ahlswede** has been appointed production control manager, and **W. H. Hartmann** has been named credit manager.

●

H. B. Weeks has been named New England district manager for United Refrigerator Mfg. Co., St. Paul. He has been with United since last November. Previously he had represented A. E. Borden Co., Boston wholesaler, in the New England area.

●

Harold R. "Hal" Linebaugh has been named buyer and merchandiser for electric refrigerators, ranges, home freezers, water heaters and traffic appliances Goodrich Co., for the B. F. Akron. Mr. Linebaugh, released from Army duty with the rank of Lieutenant Colonel last December, joined Goodrich early this year. He has had 20 years of appliance experience in the retail and wholesale trade.

●

C. V. Gregory has been appointed Pittsburgh district manager for Reliance Electric & Engineering Co., Cleveland. He succeeds **Bon J. Ballard,** who becomes assistant to the sales vice president. **L. J. Carr** is joining the Pittsburgh staff after 2½ years in the navy. He formerly was in Reliance's Chicago office.

●

W. Henry Knowlton, recently returned from a tour of duty in the Pacific theater with the American Red Cross, has joined the editorial staff of Florez, Inc., Detroit sales promotional agency. Prior to joining the Red Cross, Mr. Knowlton was sales promotion manager of Airtemp Division, Chrysler Corp. Formerly associated with the National Air Conditioning Association, Mr. Knowlton also has served with Kelvinator, Timken, and Frigidaire in sales and promotional capacities.

CONTRACTORS

News • Activities • Plans

Act Now to Stop Inroads on Cooling Field, NARC Warns

A warning that refrigeration contractors need to take immediate action to counteract the inroads being made on their business by contracting firms in related fields was sounded at a meeting of the board of directors of National Association of Refrigeration Contractors held June 8 in Cleveland.

With the industry's most prosperous period ahead, reports from many sections of the country indicate that contractors in related fields, who for the most part have had no share in the development of the refrigeration and air conditioning business, are "muscling in" by using the experienced labor trained over a period of years by refrigeration contractors, NARC directors asserted.

Particularly in the larger communities, they added, this is being done through the use of organized labor, by heating, piping and air conditioning firms whose employes are affiliated with the United Association of Journeymen Plumbers and Steamfitters, A. F. of L.

Union Drive On

NARC directors were told that the union is now putting on a hard-hitting drive for members from the refrigeration service and installation industry throughout the country, using high-pressure methods, including reduction of initiation fees, in an effort to line up as many refrigeration men as possible.

These efforts at organization of refrigeration men are being made despite the fact that a considerable number of local steamfitters' unions are reported as not sympathetic to the idea of taking in these new members as pipe-fitters.

The greatest danger to the refrigeration contractor from this phase of the steamfitters union's activities, say NARC directors, is that any heating, ventilating or pipe fitting contractor could take competent refrigeration installation and repair men from union headquarters, and use them on jobs that are far away from this contractor's normal line of work.

Although he will have had no share in the expense of training these refrigeration men to their present skills, this contractor could, by being able to commandeer such men, be in a position to bid on a commercial refrigeration or air conditioning job, often at lower than justifiable prices. For him, this additional business would be "gravy," since his overhead is paid by his regular business in the heating or ventilating field.

Far too many refrigeration contractors apparently do not realize this threat to their business, according to information gathered by NARC's Labor Relations Committee. In view of these circumstances, numerous contractors who are aware of this have urged NARC to establish immediately a labor policy for those members who are, or may be, employing union labor.

These contractors feel that the commercial refrigeration industry is big enough, and important enough, to rate recognition as a separate craft, with its own separate union.

The NARC opinion is expressed in the following letter to Martin P. Durkin, general president of the United Association of Journeymen Plumbers and Steamfitters:

Dear Mr. Durkin:

After reporting to the Labor Relations Committee of the National Association of Refrigeration Contractors on my meeting with you in Washington, on March 7, 1946, is was decided to hold a sectional meeting of the Association to make recommendations regarding the labor policy of the Association for those members employing union labor.

This meeting was held May 13, and the decisions are as follows:

1. **The Labor Relations Committee is recommending that the NARC hold that it would be best for the installation repair and service part of the industry to request recognition as a separate craft.**

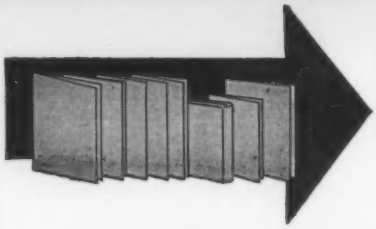
   It is the opinion that this organization could be a branch of of the United Association, but since the problems of refrigeration are so foreign from those of the pipe fitter, particularly in the service and maintenance of refrigeration equipment, and since we have the further complication of the strictly home type of refrigeration and portable, self-contained plug-in equipment, there is no place for the refrigeration repairman or installation man in the Steam Fitters' Union. Further, it is our understanding that the United Association now contains four segregations, Gas Fitters, Plumbers, Steamfitters, and Steamfitters Helpers.
2. **The apprentice program of the Steam Fitters' Union does not lend itself to the welfare of the Refrigeration mechanics or the refrigeration industry. This is especially evident in laying plans to cope with the large potential demand for refrigeration mechanics in the post war era.**
3. **Confusion exists nationally wherever the steam fitters have and are attempting to organize the refrigeration repair industry. In some towns the National Brotherhood of Electrical Workers are claiming the work, in others the steam fitters, and there is now evidence of other labor organizations starting, not affiliated with the A.F. of L., and in Los Angeles there is a separate craft union with a Charter from United Association. Some refrigeration service and installation men have joined the operating engineers union.**

   Under this condition the refrigeration repair industry will continue to be confused and actually remain an orphan in organized labor.
4. **Confusion exists in your own organization because of indecision in your locals as to whether or not they wish to accept the refrigeration mechanics as a full-fledged steam fitter. In several cities the steam fitters have to be sold on the idea and it is our belief that they are accepting our refrigeration service men only because of the threat that they might lose the pipe fitting. It is evident that the refrigeration repair man and the steam fitter will not accept each other as brothers.**

We see nothing but continued confusion under present arrangements. We do not believe that under your present plan the refrigeration repair industry will ever be satisfactorily organized and that continued disruptions, loss of time by the contractor and his mechanics will result in continued antagonism and in unsettled labor relations.

The National Refrigeration Contractor expresses himself frankly in that while he is favorable to organized labor, he will not cooperate in bringing about the impossible and impractical union of the low pressure refrigeration repairman and the steam fitter.

Continued on page 79



Useful Literature

The publications listed below are available to readers without charge. Simply list on the postcard provided in this issue the numbers of the items you wish to receive, and send it to THE REFRIGERATION INDUSTRY, 1240 Ontario Street, Cleveland 13, Ohio. Your requests will then be forwarded directly to the companies concerned.

319—Air Distribution Equipment . . . A 24-page catalog issued by Barber-Colman Co. illustrating and listing construction features of "Uni-Flo" grilles and registers for air conditioning and ventilation, "Venturi-Flo" ceiling air diffusers and "Airturn" turning member.

320—Refrigerator Hardware . . . A 36-page catalog issued by Arcade Mfg. Co. (Catalog No. 7) describing and illustrating its complete line of refrigerator hardware for all purposes. Includes locks, latches, fasteners, hinges and miscellaneous hardware.

321—Frozen Food Dispenser . . . A broadside describing and illustrating the outstanding features of the "Frez-O-Mat" self-service food sales cabinet especially designed for installation in retail food stores. Available from Frez-O-Mat Sales Corp.

322—Low Temperature Blowers . . . A 12-page bulletin (Catalog No. 110) offering practical engineering information and data on the application of overhead blowers to low temperature installations. Covers selection of proper blowers in regard to refrigerant used and recommended air velocity for specific applications. Available from Rempe Co.

323—Condenser Tube Inserts . . . An 8-page bulletin describing "Flowrites," which are metal inserts to prevent erosion at the inlet end of condenser tubes. Contains graphs, charts, and data on operation of condensers equipped with these inserts. Available from Condenser Service & Engineering Co., Inc.

324—Cold Storage Insulation . . . A 28-page manual on cold storage and low temperature insulation, complete with design specifications, installation advice, and tables showing recommended temperature and humidity conditions for storage of various food products. Available from The Eagle-Picher Sales Co.

325—Vice with Milling Attachment . . . A folder describing and illustrating applications of a vice with milling attachment for use on all types of lathes wherever light milling is required. Available from Chicago Tool & Engineering Co.

326—Shipping Jacket . . . A folder illustrating the use of the "Slingabout" padded jacket and web strap carrier for protecting refrigerators and other appliances during delivery. Produced by Webb Mfg. Co., this carrier is available in "tailor made" sizes and shapes to fit various appliances.

327—Thermostatic Expansion Valve . . . A four-page bulletin (No. 152) listing the features and explaining the adjustment and servicing of the "Thermo-Limit" thermostatic expansion valve manufactured by Alco Valve Co.

328—Temperature and Pressure Controls . . . A catalog of separate bulletins offering information and engineering details on the complete line of thermostats and pressure switches manufactured by United Electric Controls Co.

CORRECTION

In the listings of Useful Literature for May, the folder on its water coolers offered by Ebco Mfg. Co., Columbus, Ohio, was incorrectly listed as No. 185. The correct folder number is No. 293. We sincerely regret any inconvenience that may have been caused by this error.

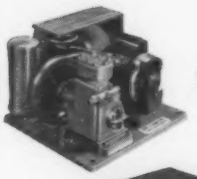
FISH food and furs will be the principal products stored in the eight refrigerating units to be installed by Rocky Mountain York Corp., Denver, at fish hatcheries throughout the State of Wyoming.

These refrigerating units, which will cost $8,751, will be used to keep fish food fresh, thus enabling the state to purchase large quantities at a decided saving in cost, according to Malcolm LeSueur, state purchasing officer. The units also will be used for the storage of hides and furs by the state game and fish department, Mr. LeSueur reports, making possible higher prices on the sale of these items.

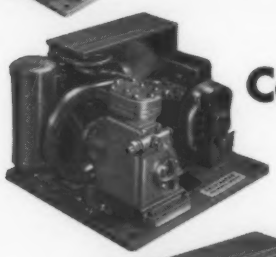
These refrigerating units will be installed in the existing hatcheries at Tensleep, Daniels, Dubois, Como Bluffs, Cody, Story, near Afton, and in the rearing pond and raceway project now under construction at Glenrock.

Three Factors that Count...
IN CONDENSING UNITS

Kelvinator's

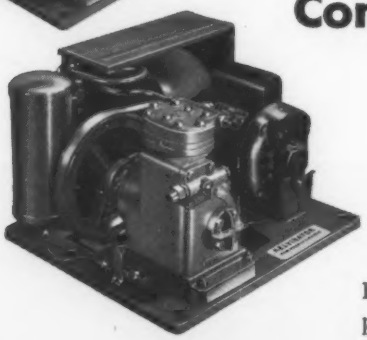


Trouble-Free Performance...



Convenient Warehousing...

Competitive Price!



HERE'S HELP FOR TRAINING SERVICE PERSONNEL

Kelvinator's "Trouble-Shooter's Guide for Refrigeration Service Men" . . . a handy pocket-size booklet for training additional personnel. Ask your local Kelvinator Distributor or Zone Office about it.

Performance, price and an easily accessible supply point are certainly important factors to the buyer of commercial condensing units . . . and Kelvinator is the best bet for getting all three!

Backed by more than 30 years experience in designing, building and engineering the development of commercial refrigeration, Kelvinator offers full assurance of dependable performance. A network of 50 strategically located depots throughout the nation will solve your problems of *where* to buy—and Kelvinator's enviable reputation in the condensing unit field will assure you *what* to buy.

KELVINATOR • *Division of Nash-Kelvinator Corp., Detroit*

CONDENSING UNITS OPEN AND SEALED

BUY KELVINATOR FOR YOUR COMMERCIAL REFRIGERATION REQUIREMENTS

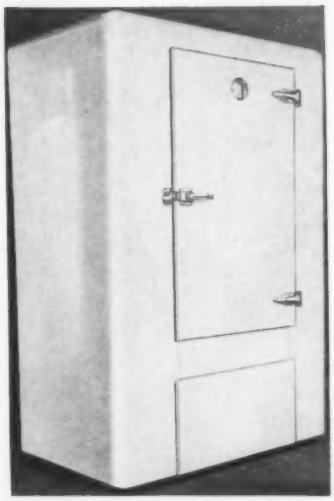
For further information on any of these products, simply list the key number at the head of each item on the special post card enclosed with this issue.

Home Freezer • • • • • P-96

Product: Home freezer.

Manufacturer: Sub-Zero Freezer Co., Inc., Madison, Wis.

Features: White baked enamel exterior. Unit is 64″ high, 45¼″ wide, 28″ deep, with storage capacity of 16 cu. ft. Interior finished with bright metal, acid and moisture proof. Model



operates normally at 0° but can be adjusted to operate as low as -20° to -25°. Freezing uit powered by 1/3 H.P. heavy duty motor.

Recording Instruments • P-97

Product: "Tempscribe" recorders for room and atmospheric temperature, and electrical operation.

Manufacturer: Bacharach Industrial Instrument Co., Pittsburgh.

Features: Easy chart replacement, because pen and bi-metallic temperature element of temperature recorder and actuating mechanism of operation recorder are located in the door of the instrument. When door is opened, pen swings out of the way, permitting unobstructed view of complete record and facilitating replacement of the 4-inch self-centering charts. Recorder can be converted to any temperature range or used as an operation recorder merely by changing the door of the instrument. Compact and self-contained, the instrument fits into a space 4½ x 5½ x 7½

inches. A recess in the back of the recorder holds extra charts and ink bottle with dropper. Temperature recorder is available in six standard time-temperature ranges; operation recorders are available with either 8-hour or 24-hour movement.

High Speed Grinder • • P-98

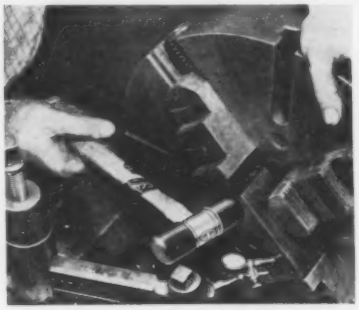
Product: Wyco Universal Hy-Speed Grinder.

Manufacturer: Wyzenbeek & Staff, Inc., Chicago.

Features: Grinder can be set on a bench, hung from a hook, or suspended from the operator's belt. Three sizes are made for light, medium, and constant duty in high speed burring, grinding, filing, sanding, or polishing; Model 00-U, ¼ hp., free speed 16,000 rpm; Model 000-U1, free speed 15,000 rpm. Motors are ac-dc type, with toggle switch in base. Flexible shafts have patented casing. Handpieces are cool running, with precision ball bearings, and interchangeable collets on all sizes.

Non-Mar Hammer • • • P-99

Product: "Kant-Mar" hammer for shop uses involving flat metal sur-



faces where mars, dents, and blemishes must be avoided.

Manufacturer: Schmidgall Mfg. Co., Peoria, Ill.

Features: Unbreakable "Castex" (hard plastic) double-head. Durable construction, light weight, and correctly balanced. Die cast head is fireproof, acid-proof, and non-conducting. Base of the head is machined from special light weight aluminum alloys, securely fastened to head but interchangeable. Hickory handle. Hammer is guaranteed for life. Each hammer registered with manufacturer and will be put in good condition at any time on payment of 50-cent handling charge.

Cold Food Unit • • • • P-100

Product: New cold food unit for

commercial food service establishments.

Manufacturer: Liquid Carbonic

Corp., Chicago.

Features: One-third additional capacity in same floor space. All metal construction with exterior surfaces and food inserts of stainless steel. Eleven inserts are standard arrangement, but other araringements may be selected as desired. Laminated maple cutting board slides back to provide ready access to food. Base is mechanically refrigerated storage section with insulated swinging door. Insulation throughout is heavy L.K. corkboard. Lift-type stainless steel hood covers food inserts. Unit may be used singly in a fountain or luncheonette assembly line, or in combination with other units. Available in 2 and 4-foot lengths.

Home Freezer • • • • P-101

Product: Model A4-46 home freezer.

Manufacturer: Deepfreeze Division, Motor Products Corp., North Chicago, Ill.

Features: Designed for small homes, apartments, and other installations where space is limited, this unit has a capacity of 3.66 cu. ft. It is a companion model to the B9-45, a 9.2-cu. ft. unit produced shortly after V-J Day.

Appliance Shippers • • P-102

Product: Protecting cases to facilitate delivery of refrigerators and other appliances.

Manufacturer: Webb Mfg. Co., Philadelphia.

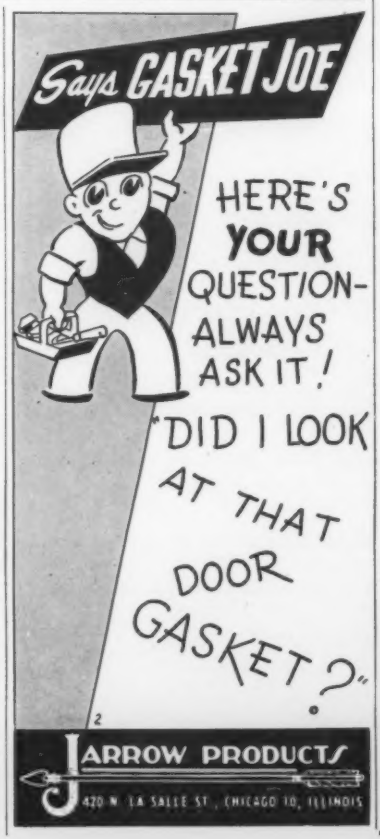
Features: Heavily padded, flannel lined, water repellent canvas jackets which are "tailor made" to snugly fit specific models. Webb belt slings straps with double ring fasteners have convenient hand holds for carrying appliances on and off trucks, through narrow doors, and in other stages of delivery from store to door.

Thermostat • • • • • P-103

Product: Hermetically sealed snap-action thermostat (Model C-4910)

for temperature regulation or high-limit alarms in cooling or heating applications.

Manufacturer: Spencer Thermostat


Says GASKET JOE
HERE'S YOUR QUESTION- ALWAYS ASK IT!
"DID I LOOK AT THAT DOOR GASKET?"
JARROW PRODUCTS
420 N. LA SALLE ST., CHICAGO 10, ILLINOIS

● Control time on a series of operations *for a whole week* . . . a different schedule every day . . . that's what you can do with a Paragon 700 Series Time Switch . . . and do it automatically.

Ideal for controlling time of heating, ventilating, lighting, pumping, flushing or similar operations.

Paragon 700 Series Time Switches are equipped with 6" calendar dials which make one complete revolution every 7 days. Dial trippers can be independently set for different daily ON and OFF schedules.

Operations from ON to OFF or from OFF to ON can be set as close as three hours apart. $24.50 List—Telechron Motored. Write for complete bulletin.

PARAGON ELECTRIC CO.
1634 Twelfth St. Two Rivers, Wis.

"Mr. Tops," The Paragon Symbol of Top Quality

$24.50 LIST
Telechron MOTORED

Paragon Two Rivers WISCONSIN
BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1905

Co., Attleboro, Mass.

Features: Thermostats are fixed-temperature, non-adjustable type, actuated by Spencer snap-action disc mounted in thermal contact with the sealed housing. Will operate in any position and are unaffected by ordinary vibration. Supplied ready to install, with 30-inch rubber, heavy-duty, two-conductor cord. Minimum temperature setting is -10°F.; maximum is 120° F. Minimum cooling differential is 8°F.; minimum heating differential is 10°F. Higher settings and wider differentials can be specified.

Rotary File and Grinder • P-104

Product: Pneumatic file and die grinder.

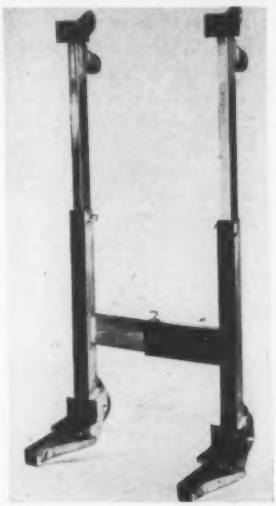
Manufacturer: Ideal Industries, Inc., Sycamore, Ill.

Features: Weighs only 16 ounces, measures 6½ inches long by 1½ inches in diameter. Rated at ¼ h.p., 19,000 r.p.m. (90 p.s.i.), with maximum speed of 25,000 r.p.m. Motor is a vane type, and becomes cooler as it works. Dust and chips are blown away by air exhaust for ports at chuck end of grinder. Collet chuck is of double grip type, so flexible sleeve holds both oversize and undersize shanks. Available with either lever or button control.

Hand Truck • • • • • P-105

Product: Lightweight home delivery appliance mover.

Manufacturer: Keen Mfg. Corp., Flat Rock, Mich.



Features: Constructed entirely of magnesium, this model weighs only 27 pounds, compared with its steel predecessor's 58 pounds. Adjustable in length from 41 to 58 inches and in width from 19 to 29 inches. Stairway hand holds fold under and snap out of way when mover is being used as a two-wheel truck. Main roller wheels are rubber cushioned; two smaller wheels built into the main supporting members permit easy pivoting in limited space. Magnesium model was developed by Keen in cooperation with Dow Chemical Co.

Appliance Temperature Tester • • • • • P-106

Product: Model 60-JRT Temperature tester for checking operating temperatures of refrigerating equipment and ovens of gas or electric ranges.

Manufacturer: J-B-T Instruments, Inc., New Haven, Conn.

Features: Checks four cold zones and two heat zones simultaneously. Gives continuous readings outside the equipment being checked so that the operator can follow results without opening doors. Measures temperatures from -100°F. to 80°F. as a resistance thermometer and from

save hours of CALCULATIONS!

THERMOBANK by KRAMER

*RAPID SELECTION TABLES for LOW TEMPERATURE APPLICATIONS

*published for the 1st time IN THE INDUSTRY

With the Rapid Selection Tables in this new Kramer book you can ascertain the BTU Load and required evaporator size as easily as you can find a number in the phone book. These tables include 1440 individual calculations covering freezers from 5' x 4' to 25' x 25', over a temperature range of from +10°F to -20°F, under various loadings and applications.

The book also includes a complete explanation of the theory, operation and application of the THERMOBANK System, in addition to a wealth of other low temperature information and data useful to refrigeration engineers, servicemen and salesmen.

Send for Bulletin 16-RI

HEAT TRANSFER EQUIPMENT

KRAMER-TRENTON Co.

TRENTON 5 NEW JERSEY

zero to 600°F. as a thermocouple millivoltmeter with bridge compensation for ambient temperatures. Also measures line voltage from 0 to 300 volts a.c.

Liquid Level Control • • P-107

Product: "Photoswitch" level control (Series 10) for all electrically conductive liquids.

Manufacturer: Photoswitch, Inc., Cambridge, Mass.

Features: Contact with liquid is made only by stainless steel probe rod. With a.c. in the probe rod, electrolytic action is possible. Mica insulated probes insure against leakage. Uses no vacuum tubes and operates with low voltage in the probe circuit. Selection from four terminals enables the control to be matched to the specific resistivity of a material. Probe circuit will carry a resistance as high as 3500 ohms. Contacts designed for motor starter, motorized, or solenoid valve operation. Arc suppression is supplied on both contacts. Designed for power supply of 115 or 250 volts, 50/60 cycles a.c., with total power consumption of ½ watt.

Home Freezer • • • • P-108

Product: Model 6TD 6 cu. ft. home freezer.

Manufacturer: The Maytag Co., Newton, Iowa.

Features: Operates at zero degrees F. in all climates and holds 300 pounds of meat or 180 pounds of fruit and vegetables. White synthetic enamel cabinet with stainless steel trim is 47½ in. long, 29 in. wide, and 32 in. high. Acid-resisting porcelain enamel table-style lid with adjustable drop leaf can be used as a breakfast or dinette unit. Defrosting pan built into unit uses heat of compressor to speed defrosting of foods. Rounded corners of cabinet interior simplify cleaning. Powered by ⅙-hp. hermetically sealed compressor with fan-cooled condenser. Spun glass insulation in semi-rigid form is used.

NEW DEALERSHIP

The ABC Refrigerator Sales Co. has opened at 813 Ft. Wayne Ave., Indianapolis, Ind. Owners are Wm. H. Lynch and Fred C. Partlen.

THE Civilian Production Administration has tightened the rules under which priority assistance is being granted to rental businesses and repair shops. Under the recently issued Direction 14 to Priorities Regulation 28 (the bottleneck-breaking regulation), CPA states that CC ratings will "rarely if ever" be granted where the rating for such an item is requested by an applicant who operates a repair shop making commercial or domestic repairs, and who wants a rating for material he will sell or install in his repair work.

NEW SALES AND SERVICE FIRM

Border Refrigeration Service, Inc. has been incorporated with $2,500 capital of $2,500 in $25 shares by Charles W. Klesse, Michael Cordisco, and Frank Pisano.

N. Y. DEALERSHIP FORMED

Charles P. Gelber, Abr. L. Evans, and Wm. Gantman have incorporated Hindle Refrigeration Service Co., Inc. of Brooklyn, N. Y.

LOOK FOR THE CAN WITH THE BLUE LABEL

ask for **DAVISON**

Refrigeration Grade **SILICA GEL**

Ninety-one percent . . . yes, more than nine out of every ten service engineers who specify a brand of silica gel, specify "Davison Refrigeration Grade". This amazing preference was revealed in a recent survey that touched every section of the country! Such a preference reveals only one conclusion . . . it must DO THE BEST JOB FOR THE SERVICE ENGINEER.

Your jobber stocks Davison Refrigeration Grade Silica Gel . . . in factory-charged dehydrators and for refilling. Always specify "DAVISON".

THE DAVISON CHEMICAL CORPORATION

Progress through Chemistry

BALTIMORE-3, MD.

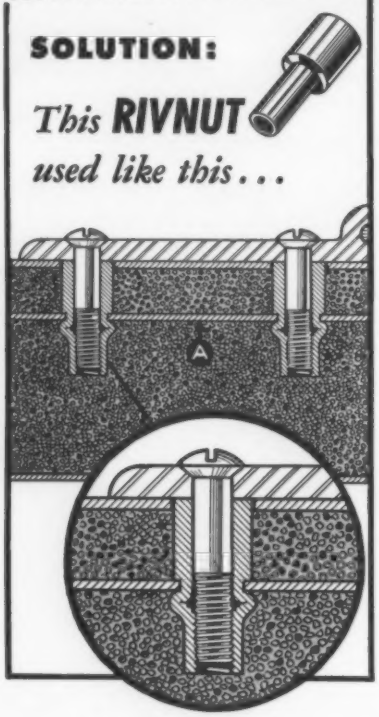
Canadian exclusive sales agents for DAVISON SILICA GEL:
CANADIAN INDUSTRIES LIMITED, General Chemicals Division

PROBLEM:

Attach heavy hinges on door of large, walk-in refrigerator. Insulation: two "sandwiches" of hard sponge.

SOLUTION:

This **RIVNUT** *used like this . . .*



SPECIAL brass Rivnuts with thick spacer heads supplied the answer to this attachment problem. The spacer head made it possible to upset the Rivnuts deep in the "sandwich," against metal sheet "A." The hollow cores of these Rivnuts, with clean threads remaining after upset, supplied a firm foothold for attachment screws. Five brass Rivnuts were used on each hinge, size ¼-20, with ½" thick spacer head.

GET NEW "RIVNUT DATA BOOK"

Rivnuts may fit into your plans in many helpful ways. Get this book now with 40 fact-packed pages telling a complete Rivnut story. For your free copy, write today to The B. F. Goodrich Co., Dept. RI-7 Akron, Ohio.

B.F.Goodrich

RIVNUTS

It's a rivet—It's a nutplate

ON-THE-JOB TRAINING . . .

Continued from page 32

Furthermore, under the compensation plan provided for in this program, the employer is enabled to obtain potentially qualified workers whom he can school in his own way according to his own methods at an initial rate far below that of the journeyman employee. By virtue of the government's contribution to each trainee's income, the trainee can afford to work for a time at a lower rate than a man of his capabilities ordinarily could afford to do.

The employer is further saved money by the fact that he does not have to buy tools for the worker. Each trainee is entitled to $100 worth of tools necessary to his chosen profession. He selects these tools at the employer's direction, and the government foots the bill.

Not only can the employer train the new employee in his own shop techniques and practices, but he can insist that the employee follow any prescribed course of outside study, through the medium of established night schools, correspondence schools, or simply home study.

Stipulation as to the nature of this supplementary training can be written right into the training outline, and the trainees are required by the VA to follow this part of the program just as diligently as they do the practical shop training. The government of course, pays the bill for up to four years (depending upon the veteran's qualifications) of this added schooling, under the provisions of the GI Bill.

Finally, the employer gets in his veteran-trainee a stability of employment often lacking in other employees. For while a trainee is at liberty to quit the entire program at any time he desires, few of them do so. For they are well aware of the VA's stern attitude toward such action, and they realize that if they drop their training for any unjustifiable reason they may never get another chance under the GI Bill.

"That salesman was right—these window coolers really do make their own weather, don't they?"

Further, the trainee is engaged in a field of his own choosing in accordance with his proven aptitudes, and is working toward a definite goal, both of which are factors definitely tending to result in stability of employment.

The VA really has, in connection with this training program, a threefold obligation and responsibility—i.e. to the veteran, to the employer, and to the taxpayer. It is endeavoring to discharge this obligation to the best of its ability by working out on-the-job training arrangements which will be mutually beneficial to trainee and employer . . . . and which will cost the taxpayer (and that includes you, Mr. Employer) just as little as possible.

TOPS! for LOW TEMPERATURE

DOLE *Vacuum* **COLD PLATES**

Maximum Refrigeration Efficiency

for all REFRIGERATION PURPOSES

Investigate . . . . then you will specify . . . . DOLE Vacuum Cold Plate Evaporators for maximum refrigeration efficiency.

See your Refrigeration Dealer

Dole Refrigerating Company

5910 N. Pulaski Rd., CHICAGO 30, ILL.
New York Branch:
103 Park Avenue, New York 17, N. Y.

LIQUID SYSTEMS . . .
Continued from page 37

4. Operate the unit with "blocked" condenser until the head pressure is approximately 150 pounds.

5. Close the suction service valve and intermittently operate the compressor until the compound gauge reads approximately 0 to 1 pound.

6. Stop the compressor. Under the above conditions the maximum leak back past the discharge valves should be a pressure rise in the crankcase of the compressor at the rate of about 3 pounds per minute. A pressure rise greater than this indicates discharge valves that should be replaced.

7. Open air passage through condenser by removing "block."

8. Intermittently operate the compressor until the crankcase pressure is reduced to approximately 20 inches of vacuum. Efficient compressor suction valves will hold a 20 to 22-inch vacuum against a 90 pound head pressure.

Compressor Valve Replacement

To replace compressor valves, the general procedure is as follows:

1. Install a suction gauge on the compressor suction service valve.

2. Close the suction service valve by turning all the way to right.

3. Reduce the crankcase pressure to approximately 1 pound by intermittently operating the compressor.

4. Stop the compressor.

5. Close the discharge service valve by turning all the way to the right.

6. Remove the head bolts holding the cylinder head to the cylinder block.

7. Remove valve plate.

8. Select new valve plate or suction and discharge valve reeds, and install using new gaskets.

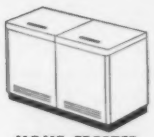
9. Replace valve plate, head, and head bolts, and tighten down evenly.

10. Remove the service gauge connection plug in the discharge service valve.

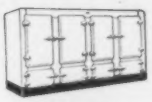
11. Start the compressor and run until the suction gauge reads about 24 inches of vacuum, in order to remove the air from the compressor.

12. Crack suction service valve on the compressor slightly to the left, admitting refrigerant vapor to the compressor to purge the air out of the compressor head. Purge in this manner approximately five seconds.

Planning New Appliances?



HOME FREEZER



CABINETS

Designing New Installations?

LOCKER PLANTS

STORAGE

***ZEROCEL** will Save You Money!*

● If you're looking for a low temperature insulation that will cut costs without cutting quality, here it is! Zerocel is one of the few insulations with ideal properties for practically every type of low temperature construction. And it is so *economical* you can install it much thicker than ordinary insulations for the same or less money. This reduces your refrigeration (and, of course, the size of your compressor) to the lowest possible minimum, which means big, steady savings in both power and equipment.

Efficient? Zerocel has a thermal conductivity (or "K" factor) of only 0.24 Btu. at 60°F. mean temperature. Dependable? Zerocel is one of the famous Gold Bond Products manufactured by National Gypsum Company and is backed by years of successful installations in the low-temperature field. Sales-clinching Gold Bond Zerocel stickers for appliances and job signs for installations are *free* on request.

ZEROCEL PROPERTIES:

- Completely fireproof
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Zerocel is manufactured to U. S. Dept. of Commerce Standard CS 105-43. Samples and literature on request.

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13. Replace discharge service connection plug.

14. Open and back-seat both suction and discharge service valves by turning stems all the way to the left.

15. Remove suction gauge and replace service connection plug.

Adding Refrigerant

The safe way to add refrigerant to a condensing unit "in service" is to pump the refrigerant in through the suction side on the compressor. The procedure is as follows:

1. Back seat (turn all the way to the left) the compressor suction service valve.

2. Remove the service connection plug.

3. Connect a charging fitting to the service connection on the suction service valve, and attach the charging drum. Always have a compound gauge connected in the charging line.

4. Before tightening the flare nut on the charging fitting, the valve on the drum should be opened slightly to permit purging the charging line to the suction service valve.

5. Flare nut should then be tightened. Turn the suction service valve to the neutral (central) position.

6. Start the compressor and open the refrigerant drum valve about ½ turn. The refrigerant drum should always be upright when charging through the compressor. If the suction pressure rises above 20 lbs., close off the drum valve to prevent overloading the compressor.

7. Close the drum valve after a few minutes of charging and check for sufficient charge in the system.

8. When sufficient refrigerant is in the system, close the drum valve and pump down the charging connection to about 1 lb. Back seat the compressor suction service valve, disconnect the charging fitting, and replace the service connection plug.

Adding Oil

Should the oil level appear to be low, the first step should be to check the refrigerant charge to insure that oil is returning from all evaporators. If okay, add oil as follows:

Repeat operation 1, 2, 3, 4 and 5 under "Compressor Valve Replacement." Remove the oil filler plug in the crankcase.

Add oil to bring the level to the proper height (see manufacturer's recommendations). Use only oil recommended by the condensing unit manufacturer.

Guard Against Moisture

Extreme care must be exercised when servicing any refrigeration unit to prevent moisture from entering the system. Even the use of ordinary oil or permitting humid aid to enter the system can deposit enough moisture to cause trouble.

A mixture of Freon and water with the low temperature resulting from expansion will cause a small particle of water to freeze over the small seat orifice or in the restrictor (capillary) tube.

Moisture causes trouble at the point where the refrigerant drops to low temperature, as at the expansion valve, low side float needle, or at the evaporator end of restrictor (capillary) tubes. The moisture will freeze out and form ice, plugging the orifice, restricting the flow of liquid refrigerant, and resulting in intermittent or irregular refrigera-

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STANDARDIZE on copper plumbing with NIBCO WROT Copper Fittings for real satisfaction . . . and greater profit. Strict laboratory control assures positive uniformity, strength and quality. Accurate tolerances maintained by individual plug-gauge tests assure easy up-fitting and leakproof joints with less labor. If you haven't used NIBCO Fittings, better start now.
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VALVES AND FITTINGS SINCE 1904

tion. The restriction may become complete and cause continuous operation of the condensing unit with little or no refrigeration.

A "grain" of moisture is actually a sphere or ball of water about $\frac{3}{16}$" diameter which when frozen is sufficient to completely block the orifice of a large expansion valve. Smaller amounts of moisture in the system can and do collect at the expansion valve orifice and partially obstruct the flow.

Danger from Freezing

Moisture may freeze an expansion valve needle shut or open depending on the postion of the needle at the time the particle of moisture hits the valve.

If the needle is frozen shut, the following will result: The temperature will be too high in the refrigerated compartment; the evaporator will not be completely refrigerated—that is, it will be "starved"; the condensing unit will short cycle or run continuously, depending on the temperature control bulb location; the suction pressure will be abnormally low; and the suction line will be warm at the evaporator outlet.

If the needle is frozen open the orifice is not completely plugged, this will happen: the evaporator will flood over into the suction line, generally resulting in frosting back if the back pressure is low enough; the running time will be long; the suction pressure will be either normal or too high; and the compressor may be slugging or pounding excessively.

Make Moisture Check

To check for moisture, attach a compound gauge to the suction service valve. With the compressor running on a system having an ice plugged valve or capillary, the reading will be abnormally low. Apply heat to the expansion vave, low side float, or the outlet end of the restrictor tube to melt any ice which may have formed within.

The compound gauge will register a decided increase in pressure the moment the ice melts and breaks loose, freeing the flow. There will also be a noticeable sound of the liquid refrigerant rushing through the valve or line.

If the diagnosis indicates presence of moisture in the system, the drier may have become saturated with all the moisture it can hold. Either replace the drier with a new one or replace the drier charge with fresh, dry dehydrating material if it is a rechargeable type.

If excessive moisture or water has entered a system a complete oven bake-out of all removable evaporators, valves, and the condensing unit will be necessary. Fixed evaporators must be thoroughly blown out with dry, warm air or dry CO_2, or the fixture may be warmed up with heating lamps and a high vacuum pulled on it to dry out the evaporator.

If warming up the valve does not eliminate the restriction, then the trouble may be due to the restrictor tube or drier being clogged by dirt. To check, crack the flare nut on the outlet side of the dehydrator. If there is a liquid discharge and the nut frosts, the restrictor is plugged. The absence of liquid at this point on a "Liquid" ice cream cabinet indicates either a shortage of refrigerant, a plugged drier, or a float

To keep
AN OLD SYSTEM
Running...
KEEP IT DRY!
Old, often leaky, refrigeration systems are especially vulnerable to damage by freezing. And with new equipment curtailed and replacement parts hard to get, a forced shutdown can easily be prolonged indefinitely.
HOT WEATHER PRECAUTION! Get rid of excess moisture with a special DFN High Moisture Cartridge.* Then, switch to the standard DFN cartridge for triple protection against moisture, sediment and acid.
The quick interchangeability of DFN cartridges makes servicing cleaner, faster and safer. The hermetically sealed, factory-assembled cartridges are quickly inserted in the demountable shell without loss of dehydrating strength. The extra capacity of the DFN cartridge's exclusive strainer-filter assembly makes servicing less frequent. Ask your distributor about this versatile, complete protection system. Write for catalog R-7.
*Other special DFN cartridges available to combat unusual conditions: Acid and Moisture, Sediment and Sludge, Sediment and Moisture, Sediment.
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which is stuck shut.

The remedy for a plugged restrictor on a "Liquid" ice cream cabinet is to disconnect the pull-out coil at both ends, and blow backwards through the restrictor using CO_2 or refrigerant gas for pressure. If this won't clear out the dirt, replace the pull-out coil. Plugged driers must be replaced.

Dry out expansion valves and float valves by blowing out the moisture with dry warm air, CO_2, or refrigerant gas, or preferably "bake" in an oven. The valve inlet screen should also be removed and blown out.

All parts of the system are thoroughly dried by the manufacturer before assembly. Service engineers should be sure that internal surfaces of tubing, gauges, drums, etc., used in service have not been exposed to moisture.

The service engineer must always use extreme care to prevent moisture from getting into the system particularly when breaking frosted or sweated connections. Don't break a connection while it is cold and wet, for a small amount of moisture is enough to cause trouble. Likewise use extreme care when adding oil and refrigerant to prevent air or moisture from being drawn into the system.

Moisture may freeze out on the walls of the evaporator. When a very wet system is dried out the evaporators must be warmed up to cause the moisture to pass along with the refrigerant to the dryer.

Fan Aids Drying

This process may be speeded on an ice cream section or cabinet by removing the lids and blowing across the openings with a desk fan. When warm, remove the drier at the high side float or receiver outlet and let the refrigerant charge blast out.

On high side floats, open the purge on top of the float, releasing the refrigerant from the float. Close the purge valve and install a new drier. Charge the system with dry Freon and operate the pump intermittently, with the lids open and the fan blowing across the sleeves. On "Liquid" ice cream cabinets the refrigerant charge circulates through the system about 10 times an hour, and by keeping the sleeves well above freezing it should be possible to dry the system with a new drier in one to two hours operation.

Silica Gel Helps

Silica gel driers, in addition to removing moisture by the physical action of surface absorption and capillary attraction, will also remove any acids and gun forming compounds that may be present in the refrigerant. In effect, the silica gel drier purifies the system up to the limit of its capacity to remove these materials.

It must be understood that silica gel driers will also remove any inhibitors such as alcohol or similar anti-moisture products in addition to the moisture and in the same proportions as they exist in the refrigerant liquid.

If a system is "loaded" with alcohol, the drier may become saturated with a mixture of moisture and alcohol and yet not necessarily remove all the moisture from the system. It may be necessary to install two or more driers before such a system is completely free from moisture.

MODERN
REFRIGERATOR
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NATIONAL LOCK COMPANY
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SINCE 1914

VALVES — DRIERS
STRAINERS

For Refrigeration and Air Conditioning
Sold by leading jobbers in 130 cities

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PRECISION

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In the Baker laboratory, where designs become machines, the most modern and scientific equipment is used. Electronic balancing equipment—the Vibrascope and the Vibrameter eliminate vibration caused by inaccuracies as little as 1/10,000 of an inch. The Stethoscope is used to magnify and locate any noises below normal ear level. Thus, we safeguard Baker reputation—and assure the long life and *dependable* performance of Baker Machines.

Baker
ICE MACHINE CO., INC. OMAHA
MANUFACTURERS OF REFRIGERATION AND AIR CONDITIONING EQUIPMENT SINCE 1905

LOCKER PLANT . . .

Continued from page 42

The tubing runs from the locker and the sharp-freeze rooms through the chill room before reaching the engine room.

Refrigerating machinery, locker, and sharp-freeze rooms comprise two 5 HP Par water-cooled Freon-12 units, equipped with oil separators and discharging into one 10-ton water-cooled condenser. A 2 HP water-cooled unit serves the chill room.

The condenser used with the two 5 HP machines has no liquid stored in it, and operates at maximum efficiency at all times. The liquid flows from this condenser into a 5 HP water-cooled condenser receiver, which is used only to sub-cool and store the liquid Freon-12. This gives a common liquid line for both locker room and sharp-freeze.

Suction lines are inter-connected, making it necessary only to open one hand valve to inter-connect both 5 HP units. This makes it possible to operate both rooms from a single 5 HP unit for light duty, or to operate both 5 HP units on one room for heavy duty.

To reduce equipment floor space, the 10-ton condenser and the 2 HP machine are mounted directly above the two 5 HP units. The machine serving the sharp-freeze room is thermostat and solenoid controlled; the unit serving the locker room is pressure controlled only, and is hooked up for a gravity feed on the coils. The coilage is connected so the warmest coil is in contact with the warm entering air. The result is a slower, more uniform frost build-up and efficient utilization of the counter-flow principle.

On installations of this type, Mr. Spear, as the refrigeration contractor, engineers and supervises the entire construction—including the specifying of the insulation as to type, thickness and method of application. Actual construction may be handled through a general contractor, but Mr. Spear, the refrigeration man, has the say-so in the selection of all materials and supplies used in the installation.

"SUPERIOR" TUBING 4 WAYS BETTER

DRY
It's true — no worries with "Moisture Free" "Superior" tubing.
CLEAN & BRIGHT
It's true — Penn tubing eliminates all foreign matter and assures trouble-free installations.
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It's true — High labor costs are reduced with uniform anneal and easily formed tubing.
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It's true — "Superior" tubing has added strength and uniformity.

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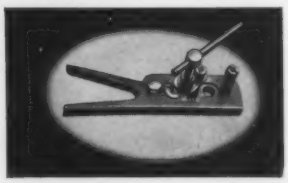
As in the case of the finished product, manufacturers and repair organizations must give careful consideration to the quality of material that goes into their work. Dryness is a *must* in copper tube requirements and Penn's "Superior" quality stresses Dry, Clean tubing with our new modern dehydration processes.

PENN TUBING IS "SUPERIOR"

FLARING TOOL
Only PAPCO gives you six tools in one!



In presenting a selective clamp, we have developed a tube flaring tool which will quickly select the size for all jobs requiring hand tool flaring. With all parts specially hardened, you have definite assurance of long life and smooth handling in each Papco # 400 tube flare tool. Write for latest Papco Bulletin.

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ELIMINATION of all unnecessary controls, thermometers, and automatic equipment enabled the German refrigeration industry to keep pace with wartime demands, according to a report made for the Joint Intelligence Objectives Agency by E. T. Simonson of the U. S. Engineers.

Though the Germans made no noteworthy advances in the manufacture of refrigeration equipment, this report indicates that they did develop novel practices in the application of such equipment to military use.

Simplicity of plant layout and dependence on manual rather than automatic control led to standardization of equipment. Consequently, few spare parts were needed.

The Simonson report briefly describes representative refrigeration plants throughout Germany and discusses the adaptation of the industry to the needs of the German army. It supplements an earlier report by the same author. Both reports are available from the Office of the Publication Board of the U. S. Department of Commerce.

FEDDERS-QUIGAN EARNINGS

Fedders-Quigan Corp., Buffalo, earned about $400,000 in 1945 compared with $15,498 in 1944, chairman F. J. Quigan has reported. The company has been under its present name since Jan. 2, 1946. Sales in 1945 were $6,700,000, against $5,600,000 in 1944.

ALL St. Louis bakeries, restaurants, luncheonettes, etc., now must prove that they have "certified" refrigeration equipment to maintain temperatures of 50° F. or less before they will be allowed to sell whipped cream or custard products during the summer, according to a recent regulation imposed by the St. Louis City Health Department.

A warning against the sale of chocolate eclairs, cream puffs and custard or cream filled cakes and pies during the summer hot season was issued by the department on May 4 to all food associations in the city. The edict pointed out that all such items have a tendency to spoil quickly during hot weather, and that there were numerous cases of food poisoning in the past which were traced to lack of adequate refrigeration.

The health department has ordered that manufacture and sale of products containing whipped cream or custard be discontinued during the period from June 1 to Oct. 1, unless these products are kept under certified refrigeration of 50° F. or less from the time of manufacture to sale. Bakeries or restaurants wishing to sell these products are required to have their refrigeration facilities approved by a health department refrigeration inspector.

NEW PLANT BUILDING

A new factory building is being erected at 7250 East Slauson Ave., Los Angeles, for Refrigeration Engineering, Inc. The building will be 160 x 480 feet in size and cost $98,000.

MOVES TO NEW SITE

Refrigeration Equipment Co., Austin, Tex., has moved to new and larger quarters at 402 E. 2nd St., reports Allan Henry, in charge of sales and engineering for the company. The company specializes in locker plant and air conditioning installations in 40 Texas counties.

THOMAS HEADS APPLIANCES FOR AUTO SUPPLY STORE

Don Thomas, recently returned exserviceman, has beeen appointed sales manager for the major appliance department of Marshall Auto Supply Co., Denver. The firm recently opened a new store at 1530 Broadway in the heart of the city's downtown area.

EXTRA PROFIT on every job

Standard and Special

Contractors, service organizations, and equipment dealers can make an extra profit on every job by selling Albert H. Bromann Jr. refrigeration products. . . . Sold only through recognized, established outlets.

Write on your business letterhead for complete information.

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SCHILLER PARK, ILLINOIS

WATCHDOG

This tiny cone strainer, measuring only 1½ inches, protects the cleanliness of *"EXTRA DRY ESOTOO" and *"V-METH-L" as faithfully as a mastiff guards his master's property.

If rough handling should ever chip small metal particles from the interior cylinder wall, this strainer, the watchdog of cleanliness, keeps this foreign matter out of the system—prevents injury to the valve seat. It is just one of the extra little things that combine to give you service surety when you use VIRGINIA REFRIGERANTS

VIRGINIA'S brand names for high purity Liquid Sulfur Dioxide and Methyl Chloride.

Distributors of "Freon" Refrigerants 11, 12, 21, 22 and 113

VIRGINIA

VIRGINIA SMELTING COMPANY

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NEW YORK • BOSTON • DETROIT

Increase Your Profits

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YOU'LL get repeat orders, increased business and more profit with *Texaco Capella Oils* — recommended, used, or *approved* by leading manufacturers of air conditioning and refrigerating equipment. *Capella* offers these money-making features . . .

DEPENDABILITY: *Texaco Capella Oils* are highly stable, free of moisture, have very low pour tests. They resist gumming and sludging, do not react with refrigerants. Quality is always uniform.

PACKAGING: *Texaco Capella Oils* come in handy 1-qt., 1-gal., and 5-gal. *re-sealable* containers that keep the oil in perfect condition. Packages make extremely attractive displays which help you sell more — make more.

RANGE: *Texaco Capella Oils* are available in every needed viscosity, and Texaco's helpful FREE LUBRICATION GUIDE shows the correct one to use for each of 55 electric refrigeration and 32 air conditioning units. To prevent errors, bind the Guide in your manual or use it as a wall chart.

Send for your FREE LUBRICATION GUIDE today. For prompt delivery of *Texaco Capella Oils,* just call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Capella Oils

FOR ALL AIR CONDITIONING AND REFRIGERATING EQUIPMENT

TEXACO

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT — CBS

HANDING out checks ranging from $2 to as much as $1,500 to Carrier employes is the pleasant job of Herbert O'Connell, Carrier's "Suggestion Administrator". The checks are awarded for ideas submitted by the employees and adopted by the company.

Carrier had long made a practice of welcoming and paying for meritorious employee suggestions, but it was not until two years ago that the system of awards was put on a regulated business basis.

Mr. O'Connell now has 34 strategically located suggestion boxes and a messenger who collects the suggestion slips twice daily, like a regular postman.

When he receives the suggestions, Mr. O'Connell immediately sends each donor a receipt, so that he will know his suggestion is under consideration. All suggestions are then retyped and identified only by number before being passed on to the award board. This is done to preclude any possibility of favoritism.

And how is the suggestion business these days? It's booming! For in the two years that Mr. O'Connell has operated the system he has handed out an average of one check every two days to some enterprising Carrier employee.

JAHCO STOCK SALE

In statements filed with the SEC, Jack & Heintz Precision Industries, Inc., Cleveland, is planning to offer 50,288 shares of preferred and 550,000 shares of common stock for public sale. The company expects to raise around $13 million, to be used to provide additional working capital. This will be the first public offering of Jahco stock.

At a recent meeting of the board, Byron C. Foy was elected president to succeed B. C. Milner, Jr. William S. Jack is board chairman and Ralph Heintz is vice president.

"You'll always be sure of fresh eggs with this refrigerator, Ma'am."

THE PRACTICAL Refrigeration Engineering MANUAL . . . by Harold Smith

XII. Candy and Chocolate Processing

CONCLUSION

WHEN gas flames are used, figure 1000 B.T.U. per hour per cubic foot of gas consumed.

With electric heating elements, figure number watts per hour x 3.5 multiplier for added heat load.

The standard load figures apply and must take into consideration the number of people employed in the room for dipping, packing and other activities.

Quite frequently, the better type stores selling candy use refrigerated display and storage cases to handle candy satisfactorily during hot weather. Many stores selling candy exclusively have the store air conditioned, which eliminates the need of refrigerated cases while also providing comfortable room conditions for both employees and customers.

The candy industry offers many opportunities for the sale of refrigeration and air conditioning equipment. Sales are increased by providing a more satisfactory product, and losses are held down as less spoilage results from the use of refrigeration and air conditioning.

XIII. Bakery Refrigeration

PART I

REFRIGERATION plays an important production role in bakeries. Through the use of refrigeration, bakery products of high quality and uniform standards are produced more quickly at lower cost and with little or no waste or loss of either raw materials or the finished product.

The modern bakery, large or small, depends upon refrigeration for many purposes. The largest item of production in the average bakery is the production of bread. Flour is the largest item of the many raw materials used in the bakery.

In bread production refrigeration plays a very important part, beginning with the cooling of the flour while held in storage. While many small bakeries do not put their flour in refrigerated storage rooms because of the limited space available and the cost of the necessary equipment required, all bakeries, large or small, take every precaution to store the flour in a cool location.

If refrigerated storage is not available a cool, dry basement usually is used for this purpose. Flour at relatively cool temperatures keeps in good condition for a much longer period of time, resulting in little or no loss or waste and also is mixed into bread batter more quickly and at lower temperatures providing a uniform standard of quality in the finished product.

STORAGE TEMPERATURE

Where refrigerated storage is used a temperature of from 65 to 75° F. is maintained, with a relative humidity between 55 and 65%. If the storage cooler is constructed with insulated walls, the refrigeration load is relatively light, even though a sizeable quantity of flour may be carried in storage and the storage room

YORK NAMES NEW CAROLINA OUTLET

Sneeden - Spivey Co. has been named as the New York distributor in Wilmington, N. C. to replace Sneeden - York Corp., which has moved from Wilmington to Raleigh, N. C.

The new distributor will handle standard York equipment in the southeastern quarter of the state, including Beaufort, Bayboro, New Bern, Trenton, Clinton, Whiteville, and Laurinburg.

W. B. Spivey, formerly of the U. S. Engineers, is manager of the new Wilmington outlet. J. E. Sneeden, Jr., recently discharged from the Army, is in charge of merchandising sales; A. C. Craft is in merchandising sales; Lee Raines is service manager. The company also maintains a salesman at Fayetteville.

Sneeden-York Corp., in addition to its new headquarters at Raleigh, will have a display room and sales and service organization in Durham, N. C., and a resident salesman in Wilson, N. C. Its new franchise covers the northeastern quarter of the state, including Roxboro, Sanford, Winton, Manteo, and Greenville.

J. Earl Sneeden is owner and manager of Sneeden-York and Paul O. Stahl, a native of Raleigh, is sales manager.

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itself may be of rather large dimensions.

Usually the evaporator equipment used in flour storage coolers is of the forced draft convection unit type. This equipment circulates cooler air around the bags or barrels of flour, and can be engineered to maintain the desired relative humidity so essential in this operation.

UNIT REQUIREMENTS

Units with the required capacity based on a 35 to 40° T.D. usually give the proper results. The unit surfaces should be dry, with light traces of frost on the coil surfaces during the operating cycles.

The condensing units should be closely figured for the load requirements, with 35 to 30° suction gas temperature and set to operate with relatively short off-cycles.

The off-cycles should be limited to the time required to keep coil surfaces from building ice. Careful load analysis and selection of the proper equipment is essential to good results and close control of both temperature and humidity.

REACH-IN STORAGE

Other raw materials used by bakers must also be stored under refrigerated temperatures until used. These include butter, eggs, some shortening, yeast, fruits, nuts, fluid milk, prepared pastries, creams, fillings, pie crusts and other prepared doughs which must be retarded by refrigeration until ready for use.

Storage of these materials is usually in coolers or reach-in boxes at temperatures ranging from 34 to 38° F. with 75 to 85% relative humidity. The temperatures required are considerably lower than for flour, so separate facilities must be used.

Prepared doughs containing yeast must be held at temperatures around 36° F. to retard development of the yeast culture until ready for final processing.

Fixtures commonly used for these products are walk-in coolers, standard reach-in boxes, or special reach-in boxes with a series of shelf racks for pastry trays, used for the retarding of doughs. These coolers and boxes usually are located on the production floor, with outside surrounding temperatures usually running from 80 to 100° F. summer and winter.

INSULATION NEEDED

Because of this fact, fixtures with 4 inches or more insulation should be used to properly handle the temperature difference from plus 35° F. inside the fixture to plus 85° F. outside, an average of 50° T.D.

Usually a separate condensing unit is used for the fixtures held around plus 35°, although many installations have worked satisfactorily with one condensing unit handling all refrigeration.

TEMPERATURE CONTROL

In such installations the use of solenoid valves and room thermostats, or two-temperature suction pressure regulating valves, are used to control the temperatures of plus 70° F. in the flour storage room and approximately plus 35° F. in the products fixtures. Forced-draft convection units, both ceiling type and wall panel type, are becoming increasingly popular for evaporator service in these fixtures.

Many of the specially equipped fixtures for retarding dough are completely filled with racks, requiring the use of wall panel units, since they occupy very little space in the fixture and assure a continuous circulation of air and uniform temperatures throughout the crowded fixture.

(To be continued next month)

10 NEW DISTRIBUTORS APPOINTED BY ICEBERG

Ten new distributors have been appointed by Iceberg Refrigerated Locker Systems, Inc. These distributors and their locations follow:

Sidles Co., Des Moines, Ia.; Southern Wholesalers, Inc., Jackson, Miss.; Temperature Engineering Corp., Inc., Kansas City, Mo.; St. Louis Butchers' Supply Co., St. Louis; Reynolds Refrigeration Sales & Service, Springfield, Mo.

Sidles Co., Omaha; Columbus Refrigeration Co., Columbus, Ohio; Wisconsin Ice and Coal Co., Milwaukee; Straus-Frank Co., Houston, Tex.; and Alamo Sales Co., San Antonio, Tex.

New refrigerators and other appliances "get a lift" from the new hydraulic-lift tailgate with which Harry Alter Co., Chicago Crosley distributor, has equipped its new 2-ton delivery trucks. In addition to eliminating the heavy lifting operations usually incident to loading and unloading equipment for delivery, the new device insures products being in A-1 order when they reach the customer or the dealer's display floor.

FORMS OWN SALES AGENCY

M. R. Oberholzer, general sales manager of L. H. Gilmer Co., Philadelphia, has formed a partnership with E. C. Lindsay, Gilmer district manager, as stocking distributors of industrial equipment. The firm will be known as Lindsay, Oberholzer & Co., with office and warehouse at 4432 Ridge Ave.

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Comfort Cooling Installations

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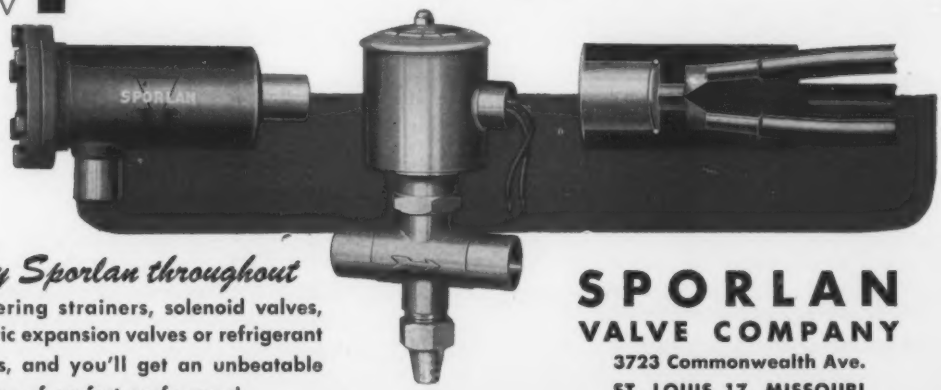

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• See Our Jobber . . . .

He'll help you select the right replacements for any motor-starting capacitors. He carries a stock for your convenience. Ask him for latest catalog—or write us.

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Over the COUNTER

EDITOR'S NOTE: The story of how the refrigeration equipment wholesaler came to occupy his present important function in the industry parallels the development of the "independent refrigeration contractor" as we know him today. For that reason it is of particular interest to "Over the Counter" readers. We continue below a brief account of the trends which led to growth of the parts wholesaler as an industry factor.

LATE in the 20's new smaller manufacturers began to appear in the picture. These manufacturers usually produced a single type of equipment or accessory. Some of these manufacturers had previously sold their particular accessory to the large manufacturer, but were now seeking to expand and enlarge their business.

Others with new ideas and products saw great possibilities in the rapidly expanding refrigeration market, and started out to establish their products in this field.

In the beginning these new manufacturers encountered considerable difficulty in securing distribution, as all well established sources were under distributing contracts with the large manufacturers and were not in a position to take on "outside" lines.

At this same period, independent servicemen and dealers began setting themselves up in business. Previously trained in the business while employed by dealers or distributors, they decided to go ahead "on their own."

One of the greatest difficulties was to secure equipment, accessories, parts and supplies. The manufacturers of the products sold through the distributor-dealer plan would not sell to these independent people other than at a consumer's price, because of their obligation to their already established distributors and dealers.

Most of these men did not know independent manufacturing sources for equipment or in the cases where they did know them, considerable expense, trouble, and delay was encountered in purchasing equipment by mail from far distant points.

The independent manufacturer was also finding it both expensive and difficult to do business direct with these independent customers, as most business was for small quantities and the wide number of specifications required to cover the numerous items of equipment called for close contact and localized handling.

This situation naturally provided a perfect setting and a lucrative field for the new group of local wholesalers beginning to appear here and there throughout the country. In the beginning they called themselves jobbers, to distinguish their independent activities from those of the franchised distributors.

"Now there, if I may say so, is how a banana split should taste!"

This name became very firmly established in the industry and was continued to be used until the fall of 1945 when the members of the national association voted to change their functional name from "Jobber" to "Wholesaler."

COMFORT COOLING . . .

Continued from page 36

materials are taken from tables oppearing in the "Guide" of the American Society of Heating and Ventilating Engineers.

EXAMPLE

f_1 = 1.65 BTU per hour per square foot per degree

k_1 (face brick) = 9 BTU per hour per degree per square foot per inch thick

b (face brick) = 4" thick

k_2 (common brick) = 5 BTU per hour per degree per square foot per inch thick

d (common brick) = 4" thick

k_3 (plaster on metal lath) = 5 BTU per hour per degree per square foot

a (2" air space) = 1.1 BTU per hour per degree per square foot

f_o = 6 BTU per hour per square foot per degree

Substituting the above values in Formula II, we have

$$U = \frac{1}{\frac{1}{1.65} + \frac{4}{9} + \frac{4}{5} + \frac{1}{5} + \frac{1}{1.1} + \frac{1}{6}}$$

$$U = \frac{1}{.606 + .444 + .8 + .2 + .909 + .167}$$

$$U = \frac{1}{3.126} = .32 \text{ BTU per hour per square foot per degree F.}$$

Heat conduction coefficients for floors, ceilings, and roofs are calculated in a similar manner, while coefficients for windows may be found directly in the tables. U, for ordinary single glass windows, is approximately 1.15 BTU per hour per square foot of glass per degree of temperature difference. This does not include solar heat effect, which will be discussed later.

In order to determine the total amount of heat conducted through a given barrier, it is merely necessary to multiply together the following three factors: (1) overall heat conduction coefficient, (2) area of exposed surface, (3) temperature difference between inside and outside surfaces. Thus, for 1000 square feet of a wall with an overall heat conduction coefficient of .32 exposed to a temperature difference of 15 degrees, the total heat conducted per hour equals .32 x 1000 x 15 or 4800 BTU.

EDITOR'S NOTE: In the article on Load Calculations, which will be presented later in this series, a method of approximating the heat load will be presented which will do away with the need for calculating overall heat conduction coefficients. It is important, however, that reader be at least familiar with the method of doing so.

PACIFIC DISTRIBUTOR

The Arctic-Temp Mfg. Co., West Coast manufacturer of frozen food locers, has appointed the Collins Refrigeration Co., of Los Angeles and Oakland, as Pacific distributor of the units. Of each-in- type, the unit has 20-cu. ft. storage capacity (approximately 1000 lbs.), stainless steel cabinet inside and out, direct conduction built-in copper coils in each shelf except the lower one, and an "economizer" which allows flooding of the coils for quick heat transfer from food to refrigerant without damage to the compressor.

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STANGARD KNOWS REFRIGERATION

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FIRST ICEBERG UNITS SOLD TO CONSUMERS

Initial consumer installations of Iceberg refrigerated locker units have been announced by Ross R. Smith, president of Iceberg Refrigerated Locker Systems, Inc., New York City.

In Casper, Wyo. the Spence Refrigeration and Supply Co. has completed installation of an Iceberg model 660, a 60-drawer unit, and will rent out the drawers to individual customers at their locker plant. This purchaser has ordered three additional 60-drawer units.

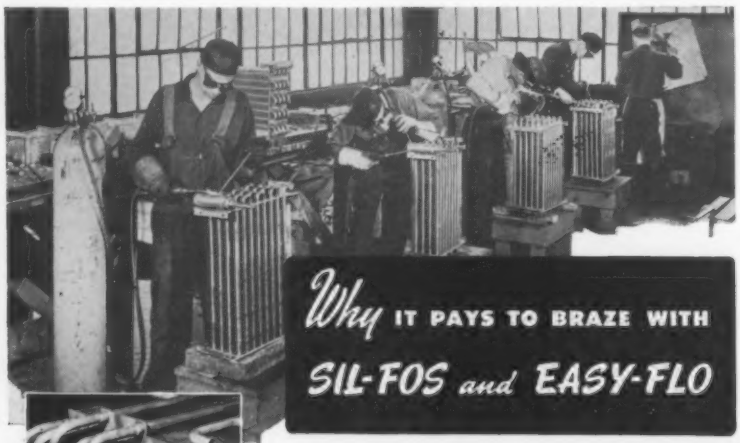
In the Philadelphia area, the Frozen Food Store at 1047 West Lancaster Ave. in Bryn Mawr has installed model 640, a 40-drawer unit, utilizing it as a large storage unit to feed small retail dispersing units.

The Clinchfield Coal Corp. in Dante, Va., purchased from H. D. Smith Sales Co. in Bluefield, Va., model 660 installing it in a commissary store for dual purposes: storage of frozen foods for resale, and for rental of individual locker drawers.

"We had such a hard time getting our new one that Paw's not taking any chances."

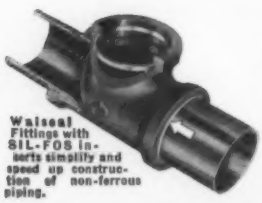
PHILCO DISSOLVES 2 SUBSIDIARIES

Philco Corp., Philadelphia, has dissolved two more of its wholly owned subsidiaries, Philco Products, Inc., which has handled the national distribution of Philco products, and Watsontown Cabinet Co. Activities of these companies hereafter will be carried on directly by Philco Corp.



Tubing connections on turbo-vacuum compressor brazed with SIL-FOS which joins nonferrous metals only.

Copper tubes and steel studs brazed to steel shell with EASY-FLO which is particularly effective in joining dissimilar metals.



Walseal Fittings with SIL-FOS inserts simplify and speed up construction of non-ferrous piping.

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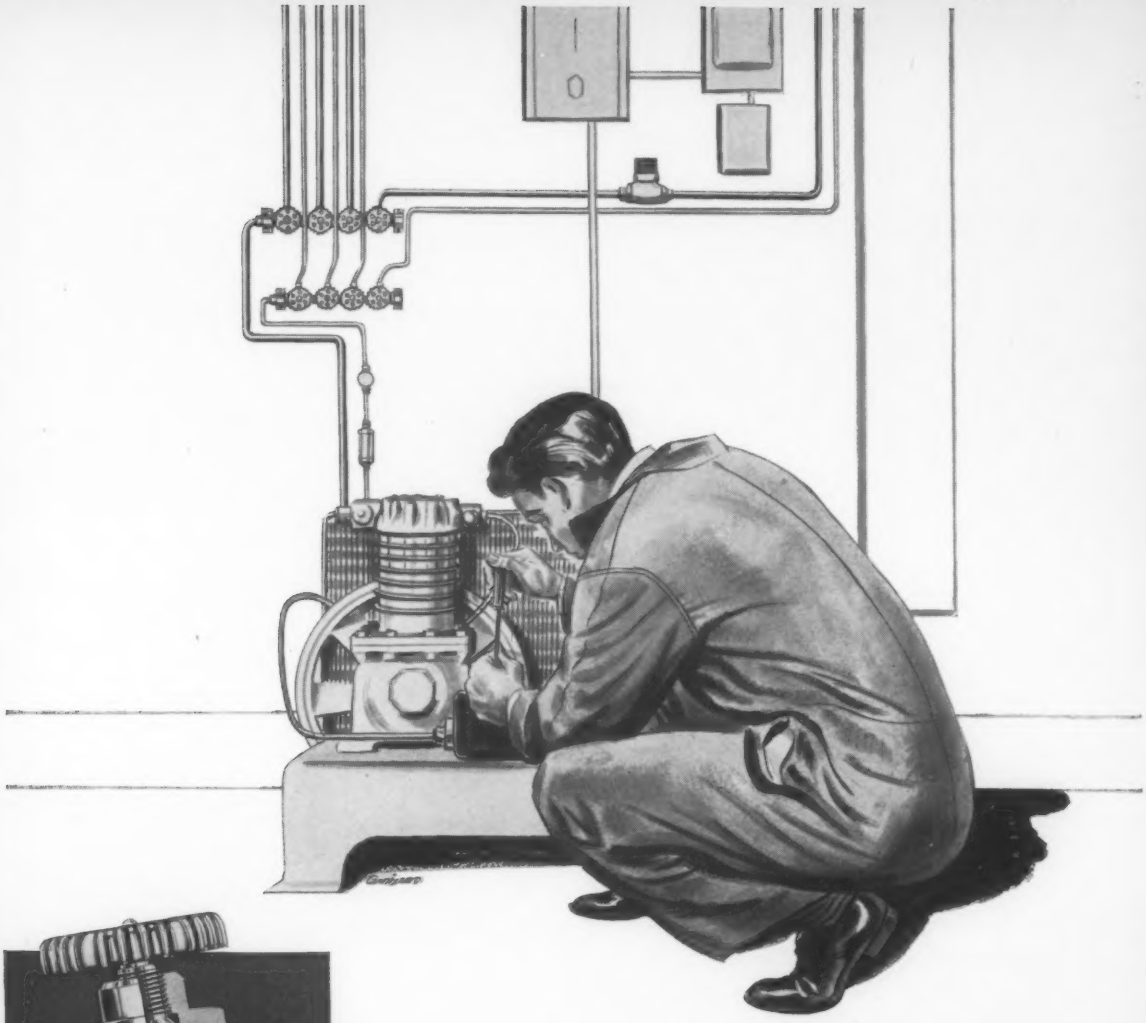

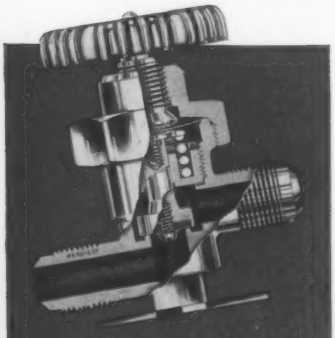

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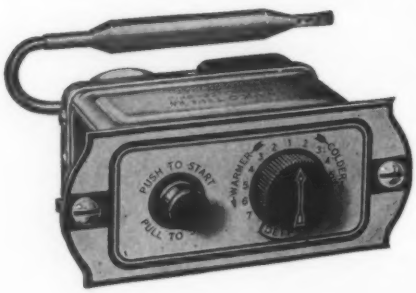

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Here's how

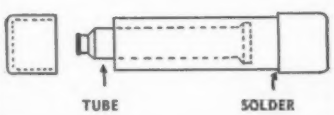
THE SERVICE MAN'S DEPARTMENT

Flaring Old Tubing

If you are trying to flare old copper tubing which has lost its anneal, and are experiencing trouble because the tubing splits while you are working with it, try this:

Using an alcohol or Prestolite torch, beat the section you want to flare until it is a dull cherry red in color; then allow the tube to cool off without quenching.

This treatment will normalize the tubing back to its original anneal, and permit a uniform flare to be made without splitting.



PIPE joint and similar compounds keep better and are more convenient to use when put up in collapsible tubes.

When carried in a tool box, however, the tube usually becomes punctured or torn.

To prevent this I made the case illustrated out of a piece of scrap hard drawn tubing and two sweat caps. One cap is soldered on the tube, the other is removable. It weighs only a few ounces and is practically air tight.

Edward A. Wenk, New York City

Where Plates Are Best

Is the use of plates practical in above freezing applications (1) in the matter of cost (2) in the matter of efficiency and (3) in the ease of installation in walk-in coolers?

A. The use of plates for applications above freezing from a standpoint of performance would be satisfactory. However, plates would be probably more costly than other types of evaporators for above freezing temperatures. The application of plates in low temperature work has the distinct advantage of being easy to clean and defrost and it is in this field that plates are desirable.

REFRIGERANT cylinders that "stay away from home" too long may bring back the refrigerant shortage we suffered through a couple of years ago—unless those who are holding the cylinders in the field get them back to the producers promptly.

Refrigeration wholesalers who are investigating the problem say that in some instances refrigerant producers report that only 25% of the number of cylinders shipped out are returned in the same period. Another producer is getting back only 20% of the cylinders shipped out.

Obviously, this condition can't continue for long without rather serious consequences. With the general scarcity of steel, production of new cylinders is much too low to allow full-scale shipments, unless the "empties" now in the field are returned.

So look around—have you a little cylinder . . . an empty one . . . in your shop when it should be on its way back "home" to the producer? If you have, tag it properly and send it on its way; or take it to your refrigeration wholesaler—he'll be glad to give you a hand with it.

On Placing Units

What are the disadvantages of having the condensing unit placed at a higher level than the cooling unit in normal temperature or low temperature jobs using either Freon or methyl chloride?

A. There is no essential difference providing the system is properly designed. Systems built both ways work equally well. Where the condensing unit is placed at a higher level the possibility of oil slugging is more likely. However, if the suction line is so arranged that oil will drain from the cooling unit down to the suction line it will then be lifted by the suction of the compressor. There is no objection to this type of installation where it is absolutely necessary.

Edited by
Warren W. Farr

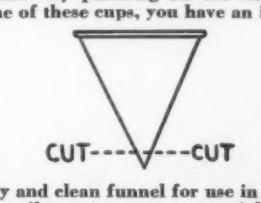
Reach-in Freezers

Will a freezer of the reach-in type permit too great a rise in temperature when the doors are opened?

A. Practically all reach-in type freezers have inner doors to prevent air change and refrigeration losses when the outer door is opened.

The reach-in type has several advantages over the chest type in the matter of accessibility and selection of foods. On the other hand, the chest type freezer is much more efficient and refrigeration losses and air changes are reduced to a minimum.

I CARRY a supply of paper "V" cups in my service car at all times. By pinching off the end of one of these cups, you have an ideal



dry and clean funnel for use in adding oil to compressors, especially in close work.

One caution: cups for this use must be kept in a good dry container, otherwise they will pick up moisture and be more hindrance than help.

T. H. Scarborough, Florence, S. C.

Steam Cleaning Caution

Would you recommend the use of steam in cleaning of cooling units?

A. Steam should be handled with care. Live steam on refrigeration

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GENUINE GRUNOW PARTS
11284-5 Carrene Motor (list) $11.50
9951-A Radiator Condenser (list) $11.00
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Carrene No. 1 (list) $3.50 per gallon in 10 gal. lots
Grunow
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surface will boost the pressure tremendously. If the system is equipped with shut-off valve so the refrigerant could be pumped down out of the coil it probably would be all right to use steam.

Here's How You Can Help Speed Production

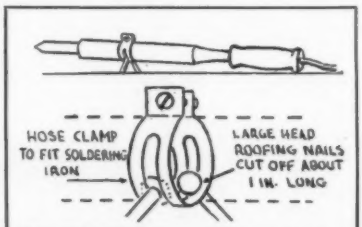
All of us want to see new commercial equipment reach the market in increasing volume as soon as possible; and yet many of us may be keeping new merchandise off our sales floors by one simple oversight—failure to get inoperative sealed condensing units back to the factory for repairs promptly.

A sealed unit that's been replaced in one of your customers' commercial cabinets isn't helping anyone when it's allowed to remain in your shop. It won't be able to help until it has been made ready for service again. See that such units are sent back to the factory just as quickly as possible.

The demand for units for replacement purposes is a steady one, and whenever the manufacturer has to "rob" his production line to meet this demand, it means one less complete new cabinet that he can supply. We can help new production by seeing that all units intended for replacement use are shipped back for repairs without delay.

Another way we can help speed up factory repair of these units is to tag them properly before they're returned, so that the factory will have some idea of what's wrong with them and where to begin repair work. For example, telling the factory that "unit doesn't run" isn't much help; explain why, in your opinion, the unit doesn't run. Then the man on the test bench at the factory can make the tests indicated and get repair work started without much delay.

Finally, when returning units for repair, pack them carefully—preferably in the same case in which the replacement unit came. This will insure the unit against damage in shipment, and additional needless repairs.



IN SERVICING and type of electrical appliances where an electric soldering iron is used, either on the bench or in the customer's home. I have found the gadget sketched here very handy. The loose type of soldering iron solder is generally out of reach, especially when both of your hands are needed on the job. This sort of holder is always ready for use.

D. L. Harter, Casey, Ill.

FIVE DOLLARS REWARD

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The Refrigeration Industry

for any information on installation or servicing procedures and short-cuts accepted for publication in its HERE'S HOW department.

Send your suggestions on shop equipment and methods, tools, or other ideas to

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Pinhole Leaks

Pinhole leaks may develop in low side float balls, permitting them to fill up with refrigerant, sink, and leave the needle wide open. This condition is not always apparent upon first inspection, since when the evaporator is pumped down so that the ball may be examined, the refrigerant is also pumped out of the ball, so that it may seem to be in good condition. If you are in doubt on this score, immerse the float ball in carbon tetrachloride and watch for bubbles, which will indicate the leak.

FOR a quick check to determine if the needle leaks on an automatic expansion valve; turn the adjusting screw all the way out, closing the valve. Then blow into the inlet side of the valve; if the needle leaks, air will come out of the outlet side of the valve. You could put your finger to the outlet side to check if any air comes out.

A clogged expansion valve strainer or moisture will cause too low suction pressure. You can easily determine if the clogged strainer or the moisture is causing the trouble. Stop the machine, and if the suction pressure begins to rise soon, it is due to a clogged strainer. If the suction pressure begins to rise after a long while, the trouble is due to moisture, for it takes time for the ice in expansion valve to melt.

Isidore Greenberg, Brooklyn, N. Y.

CONTRACTORS . . .

Continued from page 53

The Labor Relations Committee of the National Association of Refrigeration Contractors sees nothing but continued confusion under the present arrangement and under these circumstances will not recommend to the members of the National Association that they sign labor agreements with the United Association until recognition is offered as a separate craft.

The National Association of the National Contractors will withhold further recommendations to their members employing union labor, in regard to agreements with independent, craft unions under A. F. of L., or other labor unions for a reasonable length of time, that the United Association may reconsider accepting the low pressure refrigeration repair industry as a separate craft. Should your office elect to stand on the existing arrangement, the Association recommendation will definitely be in favor of the industry fostering a separate craft union.

Respectfully yours,

RAY KROMER, Chairman
Labor Relations Committee
National Association of
Refrigeration Contractors.

DETROIT CODE DEFINES MAJOR REPLACEMENTS

A recent interpretation of Detroit's municipal refrigeration code, which liberalizes somewhat the requirements for obtaining permits before going ahead with "major replacements" operations has been issued by the Detroit Bureau of Safety Engineering.

According to this interpretation, "for purposes of obtaining permits, 'major replacements' will be considered as the replacement of 'receivers, condensers, compressors, piping, etc.' on equipment of 1 ton and more capacity (1½ HP and over)."

In addition, permits are required for such "major replacements" as whole condensing units in sizes smaller than 1½ HP under the code. No permits are required for any work on self-contained household and commercial units containing a charge of less than 6 lbs of the Freon group of refrigerants, carbon dioxide, or Carrene No. 1. This exemption also applies to self-contained units in industrial occupancies with up to 20 lbs. of the same refrigerants.

The bureau explained that it had issued the interpretation to clarify matters for contractors and service men, who often were in doubt as to exactly what operations were intended to be covered.

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that removes GREASE, GRIME, PAINT without the use of water!

Gentle. Quick acting, with Lanolin and Vegetable Oils. Prevents chapping. Not injurious to skin.....

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Vilter Horizontal Compressor 7x14 with wall type Condenser and all fittings except motor $100.00. Box 7346, Refrigeration Industry.

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We buy, sell and trade household and commercial refrigeration compressors and surplus equipment. Give complete details. Have Bargains, Want Bargains. Write Myers Electric—Manitowoc, Wis.

FOR SALE—Air-cooled & water-cooled, remanufactured condensing units, ¼ up to 2 H.P. Write for particulars, Edison Cooling Corp., 310 East 149 St., Bronx 51, N. Y.

Wanted 12 Dry Ice Plants for the manufacture of CO_2 gas and solids, capacity 1 to 2 tons. Please apply to Dry Ice Utilizing Co., Ujjain (India).

Rotary Compressors, hermetic units and compressors rebuilt; guaranteed. Prompt service. Home Appliance Electric Co., 427 E. Pikes Peak, Colorado Springs, Colorado.

WANTED TO BUY—Ice cream cabinets, 2-hole size. Also any size up to 12 holes. Box 7246, Refrigeration Industry.

WANTED TO BUY—Ammonia Ice Making plant. From 2-10 tons daily capacity. Must be in good condition and immediately available. Box 7146, Refrigeration Industry.

MANUFACTURERS OF REPLACEMENT PARTS, TOOLS, HARDWARE, ETC., ARE INVITED TO MAIL FULL DETAILS ON THEIR LINES TO A RECENTLY FORMED ORGANIZATION SELLING REFRIGERATION AND HARDWARE LOCALLY AND BY MAIL TO THE TRADE. TECHNICAL SUPPLY COMPANY, 2180 AMSTERDAM AVE., N.Y.C.

NOW-PIPE JOINT COMPOUND in Stick Form

NO LEAKS!

Just rub 3 or 4 strokes across pipe threads. It spreads and fills threads when turned.

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Always Ready For Instant Use

ECONOMICAL
HANDY . . . CLEAN

Tested and Fully Approved by Independent Laboratories and Industry.

NO MESS
NO BRUSH
NO WASTE

ASK YOUR DEALER OR WRITE US

Note these FEATURES

★ Withstands Freon, methyl chloride, butane, propane and other refrigerants, oil, air, water, brine, etc.
★ Lubricates and completely seals pipe joint threads, nuts, bolts, gaskets, turnbuckles, etc.
★ Contains no lead. Contains no injurious ingredients.

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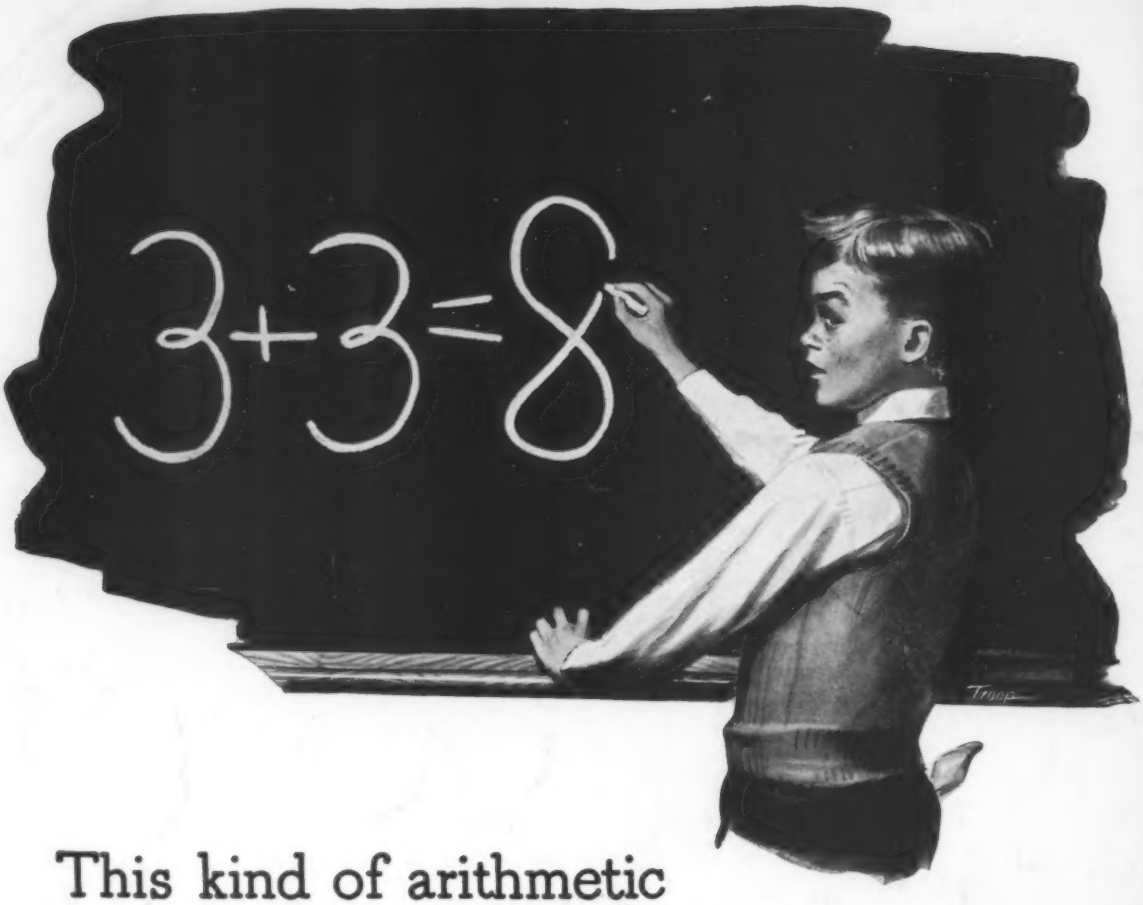

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Here's how it works out:

$3 put into U. S. Savings Bonds today will bring back $4 in 10 years.

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So it's quite right to figure that 3 plus 3 equals 8 . . . or 30 plus 30 equals 80 . . . or 300 plus 300 equals 800!

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